JULY 20, 1953

NEWS ISSUE

Electrical World

Price 35 Cents

A McGRAW-HILL PUBLICATION

Arizona Supervisors Train Themselves . . . Page 22

Meramec in Missouri: First in Half a Century . . . Page 30

New cooling techniques mean higher capacity, without increasing size, points out C. E. Kilbourne, electrical engineer in G.E.'s turbine division (right). Holding section of first liquid-cooled armature winding, Kilbourne discusses potential of this advance coupled with direct-cooled field windings (model on table) with H. D. Taylor, Manager of Generator Engineering.

NEW GENERATOR COOLING CAN CUT STATION SIZE, COST

Liquid cooling now packs more power into generators—without increasing size

Associated rotor cooling utilizes scoops in rotor surface to draw and exhaust hydrogen gas at many points along rotor length. Generator engineer C. H. Holley examines direct cooled rotor section. Uniform cooling of entire rotor permits considerable increase in capacity.

Liquid-cooling of generator stators, a new General Electric development, is a major contribution to generator progress. With liquid-cooling, about 15 times as much heat can be removed from the copper . . . therefore, a liquid-cooled winding can carry about four times as much current in the stator bars as can be carried in conventionally cooled windings.

In combination with such advances as direct gas-cooling of the rotor, and grain-oriented steel, G-E engineers are building a 3600 rpm, 260,000-kva generator in a frame size considerably smaller than previous 220,000-kva machines. Full utilization of the possibilities inherent in these developments will permit the construction of even larger capacity single units.

Present indications are that the trend to larger unit sizes will continue. The largest unit presently on order is a cross-compounded set rated 350,000 kva. While it is difficult to predict today what will be the ultimate size of individual generating units that can be economically applied, the nation's electric utilities can be confident that G.E. is fully utilizing every modern design technique to provide needed capacity without necessitating either physically larger machines or larger station structures. For a more complete discussion, write for paper GER-740, General Electric Company, Schenectady 5, New York.

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

301-234

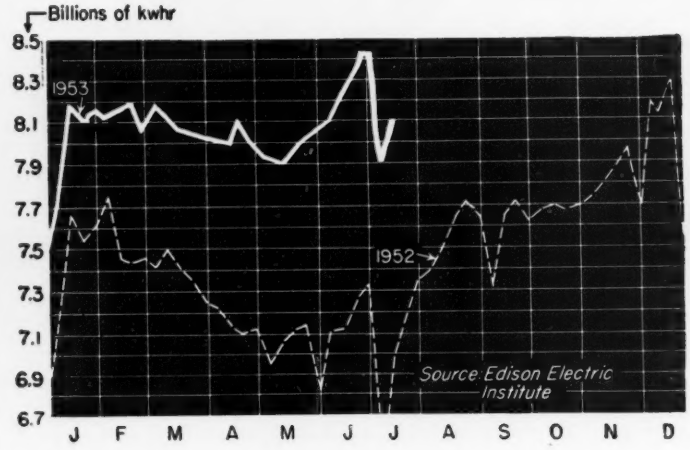
MORE POWER TO AMERICA

GENERAL ELECTRIC

VOLUME 140, NO. 3

July 20, 1953

Electrical World



Output Week Ended July 11—8,096,149,000 Kwhr

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
July 11	+15.9	—3.0	+15.1	+19.8	+13.8	+20.3	+13.1	+15.0	+15.3	+13.6
July 4	+22.2**	+26.5	+20.9	+26.3	+15.9	+28.9	+17.0	+16.6	+16.8	+16.2
June 27	+15.4	+16.3	+12.6	+20.3	+11.6	+17.3	+14.1	+10.8	+13.7	+11.8

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load (Million Kw)	May	73.5	72.9	65.9
Capacity (Million Kw)	May	84.34	83.84	77.01
Production (Billion Kwhr)	May	35.98	35.63	31.82
Hydro		10.29	9.70	9.69
Fuel		25.69	25.92	22.13
Fuel Consumption				
Coal (Million Tons)	May	8.59	8.91	8.01
Oil (Million Barrels)		6.07	7.15	3.72
Gas (Billion Cu Ft)		87.85	76.58	76.99
Sales (Billion Kwhr)	Apr.	31.75	31.73	28.33
Residential		8.86	9.10	7.91
Commercial		5.15	5.18	4.74
Industrial		15.46	15.36	13.85
Other		2.28	2.09	1.83
Net Income Class A & B Companies ($ Million)	May	82.13	86.27	68.49
Estimated Dec. '53 Peak (Million Kw)	Apr.	86.5	86.5	88.6
Kwhr per Residential Customer (12 Month Average)	Mar.	2,209	2,195	2,053
Revenue per Kwhr Residential Service (12 Month Average)	Mar.	2.76¢	2.76¢	2.79¢
Canadian Production (Billion Kwhr)	Apr.	5.75	5.78	5.03

Business Statistics

FRB Industrial Production Index†††	May	241	240	211
Gross National Product Annual Rate ($ Billion)	4th Qtr.	355.2	343.0	337.1
EW 5 Industry Production Index	May	129.6	130.2	116.0
ENR Construction Cost Index††	June	124.4	123.5	117.8
BLS Consumer's Price Index	Apr.	113.7	113.6	112.9
NEMA Insulation Materials Sales Index†	Apr.	694	694	545
NEMA Electric Appliance Sales Index†		317	356	211
NEMA Household Refrig. Sales Index†		188	211	133

*Preliminary **Revised †1936=100 ††1949=100 †††Unadjusted

THIS WEEK

The Electrical Week 5
In the Industry 10
Technical Notes 10
News About People 33
Industrial Relations 39
Sales and Service 42
Financial 44
Manufacturers and Markets 47
Electrical Business Outlook 50

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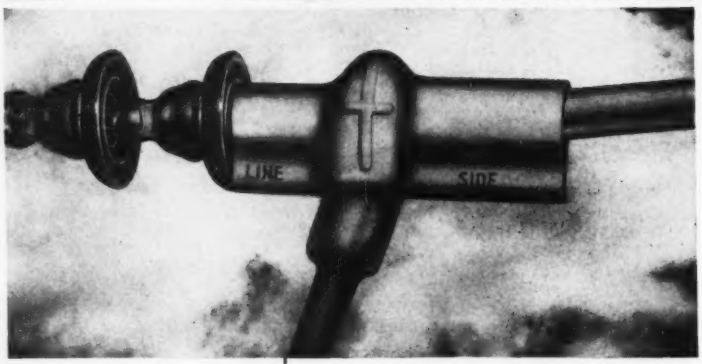
A LINEMAN ASKS—

NO. 14 IN A SERIES

"How do we blanket the 4485, 4468 and 4550 Pinco Dead-End Clamps when working lines 'HOT'?"

Here's Our Answer:



These two photographs show the blanketing method employed by a well known utility on lines where these Pinco Dead-End Clamps are installed. It's a quick, efficient, safe method using *standard insulator hood and line hose.*

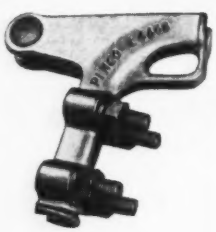
LINEMEN LIKE TO WORK WITH PINCO STRAIN CLAMPS...

HERE'S WHY—

- Easy to blanket when working lines "hot."
- Have excellent snubbing action, making them easy on the conductor.
- Gentle "wave form" seat provides maximum conductor grip.
- "Come-Along" attachment is provided for easy installation of the conductor.
- Quadrant Type design of 4485, 4468 and 4550 allows continuous "running" of the conductor —eliminates necessity of cutting conductor at dead-end points to make "jumper" loops.

That's why linemen like Pinco Strain Clamps... and here's why utilities are specifying them for quick, easy, positive clamping of conductor in distribution line construction:

1. Time-saving features permit quick, easy, positive clamping... cut installation costs!
2. Rugged design and construction assures long-life; trouble-free performance. Constructed of highest quality malleable iron properly treated then hot-dip galvanized. Equipped with Steel U-Bolts and Cotter Bolts, hot-dip galvanized, also Spring Brass Cotter Keys.
3. All Pinco Strain Clamps are available for prompt shipment.



PINCO L 4550
Cable seat range .2" to .55" will accommodate All-Aluminum and ACSR conductors No. 4 through No. 1/0 and all other conductors in its cable seat range.

PINCO L 4468
Cable seat range .2" to .68". Designed for use with 2/0 through 4/0 ACSR or All-Aluminum Conductors and others in its cable seat range.

PINCO L 4485
Cable seat range .3" to .85". Recommended for use on 226,800 C.M., 300,000 C.M. and 336,400 C.M. ACSR or All-Aluminum and all other conductors in its cable seat range.

The above clamps can be supplied with Aluminum or copper liners

PINCO INSULATORS
RIGHT ON THE JOB—

For complete information regarding Pinco Strain or Dead-End Clamps refer to Pinco Catalog No. 49 or contact the Joslyn office in your locality.

The Porcelain Insulator Corporation LIMA, N. Y.

Suspension Insulators...Clamps and Fittings...Switch and Bus Insulators... Distribution and High Voltage Pin Types...Guy and Tree Insulators...Special Porcelain.

THE ELECTRICAL WEEK

The Issue's News Highlights—Idaho Power officials testify on behalf of their three-dam development program on Snake River at FPC hearing. FPC staff report is expected this week . . . Senate Appropriations Committee recommends AEC be allowed to use funds for construction of several atomic plants to produce industrial power.

Wilbur Dexheimer, is named Reclamation Commissioner . . . FPC staff reports an intertie between Pacific Northwest and California power systems is "economically feasible.". . . Bill authorizing development of additional power at Niagara Falls by private utilities is approved by House. Senate action is not expected until next year . . . FPC grants New York State Power Authority a license for power project on St. Lawrence River.

Missouri PSC gives approval to Missouri Utilities to serve 50 residents in the Delmo housing project at the edge of Lilbourn, Mo., now being served by Scott-New Madrid-Mississippi Electric Cooperative because the co-op rates are substantially higher.

Off the New England Wire—Hartford Electric Light, basically thought of as an urban utility, hires an agricultural consultant, W. L. Harris, long identified with governmental county agency work. Increasing interest in rural electrification in company's 245-sq mi area is back of move . . . To insure wider understanding of the need for $3.6 million a year rate hike, Connecticut L&P held a preparatory meeting at its Berlin headquarters attended by about 180 contact employees.

City of Burlington, Vt., sells $2.5 million electric revenue bonds to Dwinnell, Harkness & Hill associates who reoffered them to the public at yields of 2.30 to 3.15%. Funds will be used to complete city's 27,000-kw steam plant.

Colorado's first law requiring the installation of electric garbage disposal units in all new kitchens has been adopted by City Council of Aurora, a suburb of Denver . . . Ivan Bloch, formerly head of BPA's marketing division, called on "all interested parties to contribute to a solution of vital power problems," by having heavy users of scarce kilowatts join private and public utilities in financing generating facilities of multipurpose dams.

Mississippi Power Co buys the electric facilities at Bayou View from City of Gulfport for $25,000 . . . Wisconsin Michigan Power gets PSC approval to buy a dam and hydro plant at Kingsford, Mich., on Menominee River and formerly part of Ford Motor Co, from Kingsford Chemical for $1,552,000 . . . Niagara Mohawk Power gets PSC approval to transfer $19,273,929 from depreciation reserves to earned and unearned surplus.

Guy Farmer, District of Columbia attorney, becomes chairman of NLRB . . . New York State E&G and IBEW-AFL agree to 5½% wage increase . . . Westinghouse Electric and United Electrical Workers, independent, agree to wage hikes of from 3 to 11¢ an hour. Company and Federation of Westinghouse Independent Salaried Unions agree to wage increases ranging from $5 to $18.60 a month.

Off the Washington Wire—Special committee of National Association of Railroad & Utilities Commissioners is to survey the atomic power development program with a special view to economic and legislative problems. AEC had given its approval . . . Senate Interstate and Foreign Commerce Committee has approved a bill which would permit Detroit Edison to interconnect with a Canadian electric system without coming under FPC jurisdiction . . . California Oregon Power has been ordered to apply for a federal license for five existing projects on Klamath River in Oregon and California.

Utilities using Hoover Dam energy will pay slightly higher rates this year. New energy rate is 1.336 mills per kwhr for firm power and .45 mills for secondary power. This does not include charges made for amortization and replacement of generating equipment at the dam . . . Senate passes TVA and AEC funds bill with little change from House-approved figures . . . Public power advocates are attacking the rapid tax amortization certificate issued to Washington Water Power for its Cabinet Gorge project, charging that it was issued after the project was started.

Power failed at the peak period (6:45 p.m.) on July 13 at Jersey Central P&L when a 33-kv line fell on a 69-kv bus at Raritan River station, knocking out the transmission network and the plant. There were no fatilities, injuries, or serious damages and most service was restored within an hour.

Pacific G&E asks FPC approval to construct another hydro plant on Northern California's Pit River to be known as Pit No. 7, to consist of a diversion dam, a 54,000-kw powerhouse and a small afterbay regulating dam, to cost about $16,250,000.

Atomic Utilities of Arizona applies to Arizona Corporation Commission for statewide certificate to construct and operate service equipment facilities for producing and distributing atomic-generating energy. Company is exploring possibility of obtaining franchise to build and install an atomic pilot plant that has been developed by North American Aviation Corp.

Louisiana P&L places on line 105,000-kw unit at its Nine-Mile plant . . . Dallas P&L places in operation its 87,000-kw Parkdale plant . . . Duke Power plans to spend $94.4 million over next two years on expansion.

Senate confirms A. Jack Goodwin of Alabama and J. Sinclair Armstrong of Illinois as members of SEC.

Congratulations—Rockland L&P elects Vice Pres Charles L. Hulswit president to succeed the late Fremont L. Lovett . . . A. N. Peterson, president of Public Electric Light, is elected vice president of Central Vermont Public Service, which recently acquired Pelco . . . Walter I. Dolbeare, director of industrial development for Vepco, is named chairman of electric utilities committee of Southern Association of Science and Industry.

(*Continued on page* 10)

Idaho Power on the Snake;

FOR IDAHO POWER—Pres T. E. Roach says three-dam plan is superior to other schemes

FPC HEARING EXAMINER is William J. Costello. He denied requests to delay the hearings

FOR HIGH DAM ADVOCATES—C. Girard Davidson, Evelyn Cooper represent opposition

Testimony of Federal Power Commission staff engineers assumed a crucial importance as Washington hearings on Snake River development went into the second week.

Staff presentation was slated to begin this week and it could well be the key to a final decision in the protracted high dam-low dams controversy. Directly at issue is the application of the Idaho Power Co to build a three-dam power development in the Hells Canyon stretch of the Snake River along the Idaho-Oregon border.

Roach Lead Witness . . . Point-by-point case for Idaho Power application was supplied by company witnesses headed by company Pres T. E. Roach. Policy, engineering, and financial testimony was supplied by Roach and other company officials as well as outside witnesses.

Opposition to the application came mainly from National Hells Canyon Association represented at the hearing by C. Girard Davidson, a former Assistant Secretary of Interior. During the first days of the hearing, Davidson aimed most of his efforts at gaining a 90-day continuance of the proceedings on the grounds that opponents were not adequately prepared to participate.

He told hearing Examiner William J. Costello that his clients had not yet completed arrangements for obtaining competent engineering advice. After Costello ruled that the hearing would go on as scheduled, Davidson replied in an emotion-laden voice:

"This ruling . . . can only mean that the commission does not want or desire a full hearing or investigation on the relative merits of a high Hells Canyon Dam as against a nebulous proposal of the Idaho Power Co for some small dams on the Snake River."

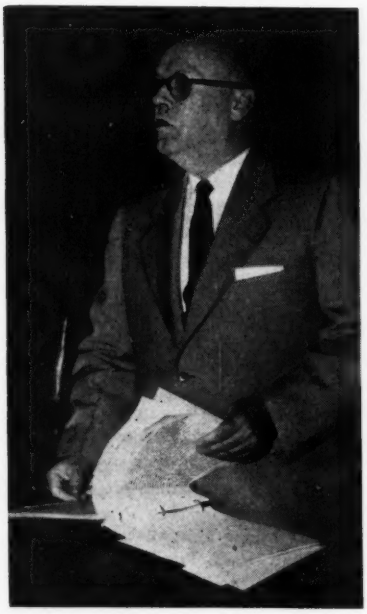
Second Try Made . . . In a second attempt to gain continuance, Davidson charged that the commission had failed to conform to set rules in ordering the hearing, and asked that Idaho Power be ordered to set out its applica-

Argues Case for 3 Dams FPC Staff Report Awaited

tions in greater detail. As an alternative, Davidson asked the commission to summarily deny the Idaho Power applications. This motion was also denied.

Main point made in these motions was that NHCA, the public power organizations, and other high-dam advocates were not prepared to contest the Idaho Power application on technical grounds. Costello and FPC staff attorney John Mason hinted that the FPC staff engineers could be depended on to provide this analysis, and indicated that Davidson might be unduly concerned about the lack of preparation of his case.

It was these hints that helped to build up the importance of the staff presentation. But there were other reasons. The staff had been studying the high dam-low dams schemes for years and is in perhaps the best position to give an independent judgment. In addition, the staff has at its disposal all the plans, studies and technical reports of Interior Department, which formerly was the most important advocate of the high federal dam.



IDAHO POWER ATTORNEY R. P. Parry says the company's plan is a multipurpose project

In deciding upon the most comprehensive development of the Hells Canyon stretch of the Snake, the views of the staff are bound to carry considerable weight in a final decision.

Company States Case . . . In presenting its case, Idaho Power witnesses made these points:

Company President Roach said he anticipated no insurmountable difficulty in financing the $134-million three-dam development, whether the dams are built in sequence or concurrently.

He testified that the company plan not only would relieve the federal government of spending upwards of one-half billion dollars for construction of the high dam and transmission lines, but would also return to the nation's taxpayers nearly that amount in federal and state taxes and license fees.

Engineer Testifies . . . E. W. Woodhead, chief consulting engineer of Idaho Power, said it was his opinion that savings of 3 to 4% could be realized if the three proposed dams were built concurrently rather than in sequence. He said he was responsible for making up the cost estimates for the company plan and believed that the entire development could be constructed for $133,000,100, exclusive of transmission lines.

Bernard Williams, vice president of Morrison-Knudsen Co, confirmed Woodhead's cost estimates and said his company would be glad to undertake construction of any single dam or the entire development on the basis of the company estimates.

Williams asserted that the difference in building a federal dam and a private dam lies in the fact that a private firm knows "when to quit" building and obtain the best results without wasting money. He said that his company, one of the largest construction firms of its kind in the world, had done all types of dam work for the Army Corps of Engineers, Bureau of Reclamation, and private power companies.

Atomic Plants . . .

. . . built by the government are nearer realization as result of $7-million appropriation

A Senate committee may have opened the door for construction by the government of several atomic plants to produce industrial electric power.

At least, the Atomic Energy Commission apparently will be in a position to seek funds for several such plants during the coming year if Congress adopts language written into AEC appropriations legislation.

Change in Wording . . . The little-noticed change of words involves the proposal already approved by the House to appropriate $7 million for construction of a reactor that would "advance technology toward both ship propulsion and the generation of industrial power." In a report accompanying the AEC funds bill, the Senate Appropriations Committee directed that AEC be permitted to use these funds for several reactors, if it so desired, rather than just one. The Senate last week approved funds of $1,057,781,000 for AEC including $7 million for reactor development.

"It is the sense of the committee," the Senate group reported, "that the door should not be closed on research and development or on construction of reactors which will advance technology toward both ship propulsion and the generation of industrial power. Accordingly, the committee recommends changes in such proviso in order to remove the limitation on the number of reactors that the commission could undertake to construct for such purposes, and requests the commission to re-program without such restriction."

This switch caught AEC completely by surprise. It had sought funds for a single reactor of the type involved as a substitute for the ship propulsion unit the Navy had planned to build. The Navy abandoned this project a few weeks ago as an economy move. The ship unit was expected to be of a capacity—upwards of 200,000 kw—that would make its development a major step toward central station atomic power.

Early Action Doubtful . . . Actually, AEC cannot take any early advantage

of the change in language, even should Congress approve the Senate committee's words. The $7 million provided for the project is barely sufficient to get work started this year on construction of such a unit.

But AEC, if it so chooses, now has an invitation to come back to Congress—in January or February—and ask for funds to start a second ship-power plant reactor.

Meanwhile at hearings before the Joint Congressional Committee on Atomic Energy, Westinghouse Vice Pres Charles H. Weaver told the group he could not guess at either the cost of a full-scale power reactor or the time required to build one. The Navy had estimated cost of the now-abandoned ship propulsion unit at $75 to $100 million but Weaver indicated this might be a little low for a full-scale central station unit.

Power Contract Liability Curb Lifted for AEC

Congress has cleared the way for Atomic Energy Commission to assume full responsibility to carry out its power purchase contracts.

By unanimous consent of both houses, Congress removed a restriction which limited AEC's liability to $57 million in the event it cancelled contracts for some 5.5 million kw of power. The new legislation permits AEC to meet such cancellation costs as are provided for in the contracts, should the contracts be terminated by AEC before their expiration date.

President Eisenhower is expected to sign the legislation this week.

Contracts affected by the legislation are those between AEC and three power suppliers: Ohio Valley Electric Corp, Electric Energy, Inc, and Tennessee Valley Authority.

AEC figures that its maximum liability under the new legislation is approximately $340 million.

This maximum is divided among the three utility groups as follows:

OVEC, which is to supply some 1.8 million kw for AEC's Portsmouth, Ohio, installation, $140 million.

EEInc, which is to supply an 735,000 kw for AEC's Paducah, Ky, installation, $69 million.

TVA which is to supply an additional 2.9 million kw to AEC's Oak Ridge and Paducah installations, $131 million.

This maximum liability would occur only in the event AEC were to cancel its commitments to buy power immediately upon completion of the power plants, was unable to provide advance notice of the cancellation, and was not able to use any part of the power capacity provided. Under any other circumstances, the cancellation costs would be proportionately less.

Wilbur A. Dexheimer . . .

New USBR Boss

New Commissioner of Reclamation is Wilbur A. Dexheimer, who has been assistant chief of construction in the Denver headquarters of the bureau.

Dexheimer's appointment comes after a six-month lag in filling the job, one of the biggest in the Interior Department.

Up to last Wednesday's press conference of President Eisenhower, Marvin Nichols, Dallas engineer, was the official nominee; in fact, his selection had been publicly announced by Secretary of Interior Douglas McKay. But in answer to a newsman's question Eisenhower said the job was still vacant because they had not found the man they were looking for.

Reasons for withdrawal of his name, according to a letter Nichols wrote to McKay, was his connection with the government operated nickel plant at Nicaro, Cuba.

Dexheimer, who is 52, was a Lieutenant Colonel in the Army's Corps of Engineers in the China-Burma-India theatre.

West Coast Tie

FPC staff report says interconnection between Pacific NW, California is feasible

Long-proposed Pacific Northwest-California intertie has been found economically feasible by the staff of the Federal Power Commission.

A 230-kv interconnection between the Northwest and California systems, the FPC report says, would make possible these benefits:

- California utilities would be able to use surplus hydro energy from Columbia River plants during high-stream-flow periods when such energy could not be absorbed in Northwest.
- Northwest utilities could make use of the energy from California steam plants to firm up secondary hydro energy in the Northwest.
- Substantial transfer of power over the interconnection would help alleviate the effects of operational emergencies, recurring seasonal power shortages in the Northwest, and aid in conserving fuel in California.

In finding an interconnection feasible, the staff studied two possibilities. Either would work equally well.

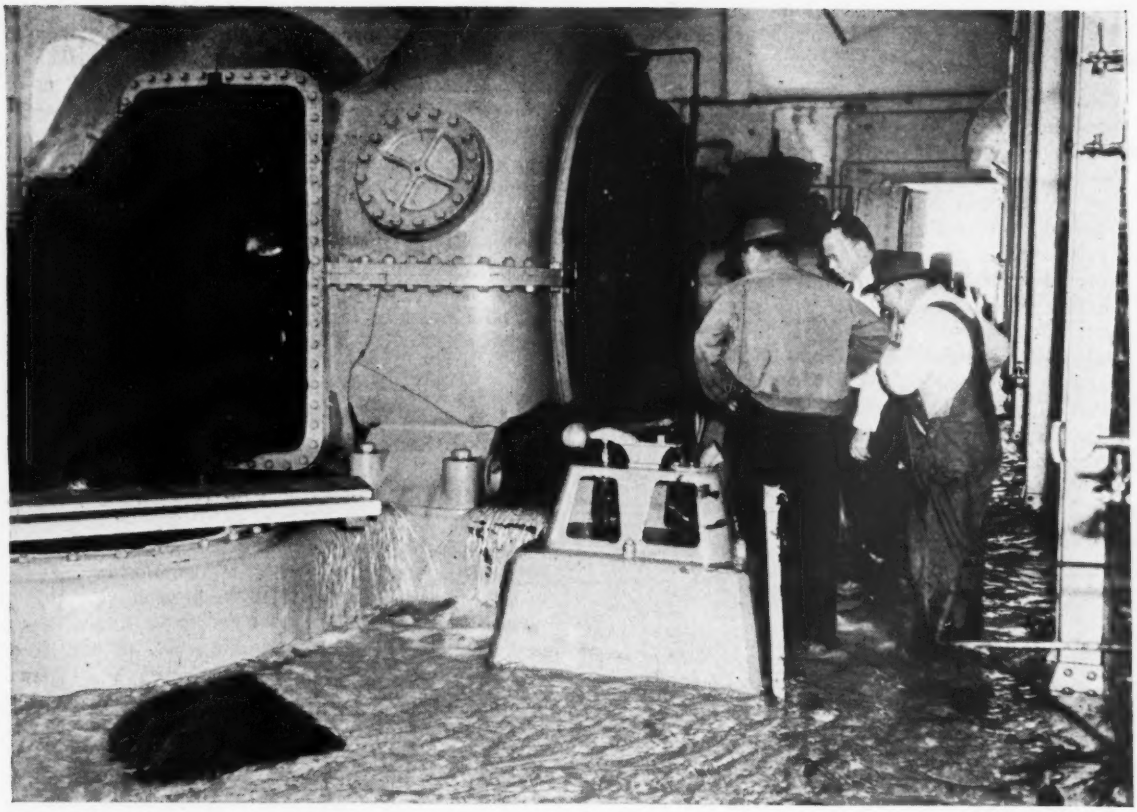
The first was a 230-kv line connecting the Bonneville Power Administration system at Klamath Falls, Ore., with either Pacific Gas & Electric Co's system in the Pit-Shasta area of northern California or with the federal 230-kv system at the Shasta plant of the Reclamation Bureau.

Second possible tie would be between BPA system at Roseburg, Ore., and PG&E's Shasta substation, with a loop into USBR's Shasta plant.

Double Exposure

Marilyn Monroe has demonstrated once more that she packs a lethal film wallop. Twice in three weeks during June, while her films were being shown at the Marine Corps air station in Cherry Point, N. C., the transformer supplying power to the projector blew out.

The projectionist at the base theater said the recent blowouts were the only two times such a thing has happened. Marine Corps officials, puzzled by the coincidence, declined comment.



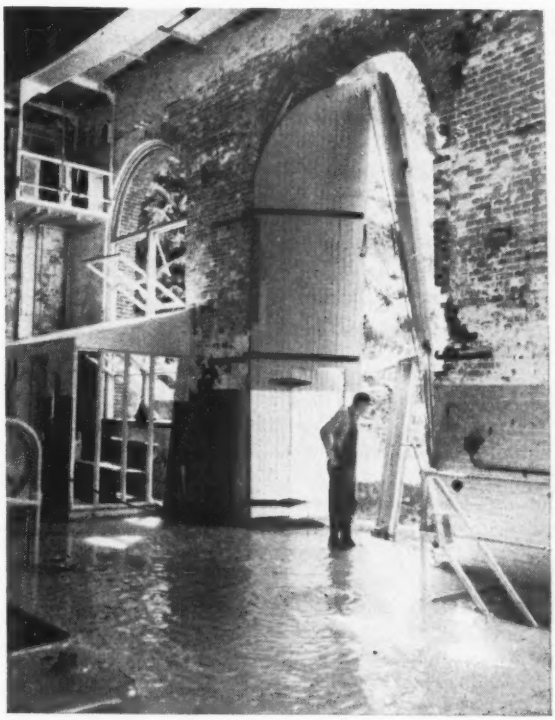
SHATTERED draft chest housing of unit No. 3 at Portland GE's Faraday hydroelectric plant is inspected by plant and company officials

Portland GE Repairing Damage at Hydro Plant

It will take the better part of six months before Portland General Electric Co gets its Faraday hydro plant humming at full capacity again. Last month the draft chest housing on No. 3 generator burst and flooded the plant. The company is proceeding with repairs but has under consideration redevelopment of the 46-year-old plant.

Water rose to a 6-ft level in the powerhouse several minutes after the accident occurred and the crew scrambled to shut down the plant manually. Chief Operator Harold Hoygaad shut down the generators but not before No. 5 burned out. Without energy, the flume gate had to be closed manually and the forebay filled so rapidly stop logs had to be pulled. This required about 15 minutes. Water poured down No. 3 penstock and roared out the plant windows and doors, one of which was torn from its hinges.

An appraisal of the damage showed extensive damage to unit No. 5. Fan blades were torn loose and the unit, as well as No. 2, has to be rewound. Repair cost is estimated at $150,000. It is expected that undamaged units will be dried out and running again this month. Other repairs will take six months.



WALL DOOR of plant was ripped off its hinges by the force of the rushing water. Section of chest housing was swept through door

THE ELECTRICAL WEEK

CONTINUED

Wind velocities averaging around 350 mph at the periphery of Worcester, Mass., tornado of June 9 developed pressures of about 300 lb per sq ft on cylindrical surfaces; 400 lb per sq ft on flat surfaces of transmission line structures. These figures were deduced by New England Power Service engineers from post mortem study of downed towers on which previous destructive tests had been made. EW will soon carry a full report.

Ohio Valley Electric asks SEC approval to sell $360 million first mortgage 3¾% bonds due in 1982 to 39 institutions and issue $60 million in 4% notes to 14 banks to mature in 1967 . . . Gordon Dean, former AEC chairman, joins Lehman Brothers, investment firm . . . President Eisenhower nominates Joseph Campbell, Columbia University executive, as AEC member.

IN THE INDUSTRY

The foreign competition controversy has flared again, this time at the municipal, rather than the federal level. The issue popped up in Detroit. There the Public Lighting Commission had recommended rejection of a low bid by Brown Boveri Corp, a Swiss firm, on construction of a $50,000 steam turbine for the city's Mistersky Station. Recommended instead was acceptance of a bid by Westinghouse Electric Corp that was $650,500 higher (EW, July 6, p 46).

Immediately Brown Boveri, through its Detroit representative, C. Allen Harlan, objected. Harlan, who heads Harlan Electric Co, which submitted the bid, was given a one-day hearing by Mayor Albert Cobo and other city officials. Nothing was decided, except that he be granted time to gather more data to show why the foreign bid should not be turned down.

As soon as the commission's recommendation became known, Detroit newspapers and others charged the commissioners were motivated by "Buy American" sentiment that would cost the taxpayers money. Frank Riley, commission vice president, denied during the hearing that any such pressures were behind selection of the domestically produced generator.

Didn't Like It . . . Harlan came up with some angry protests. Much of the hearing was devoted to clarification of various charges he had made. He had been quoted, for one thing, as saying that the consulting engineers, Burns & Roe, Inc, of New York, stood to make considerably more money if they recommended purchase of the Westinghouse generator. Mayor Cobo went to some length to establish that Burns & Roe would be paid a $70,000 fee no matter which generator was purchased. In addition to the fee, the city will pay all Burns & Roe payroll costs, plus 75% of the payroll cost to pay rentals, travel expenses, and other overhead expenses. Payroll cost cannot exceed 4.85% of total expenditures.

Harlan further implied that the city had rigged specifications for the generator to keep foreign competition out of the running.

"The engineers," he said, "went a considerable distance to keep foreign manufacturers from getting this job." He did not elaborate on the statement other than to observe that bidders were required to be licensed to do business in Michigan.

A Burns & Roe representative asserted Brown Boveri had no experience in building generators of the type required in the Mistersky Station. Harlan confirmed that, but said that the company's long experience in building other generators should qualify it to build the 50,000-kw generator. Burns & Roe disagreed, on grounds that Brown Boveri would be "pioneering" in this particular field and could be expected to have trouble in meeting requirements.

Escalation Charge . . . Harlan pointed out that if all escalator clauses in Westinghouse bid were applied, the total cost difference possible between the Westinghouse generator and that of Brown Boveri could amount to $1,234,450. No escalator clauses were contained in the Swiss company's bid.

The Burns & Roe report said purchase of the Brown Boveri generator would necessitate alteration of the Mistersky Station at a cost of $53,000. In addition, engineering costs would increase by $40,000 if the Brown Boveri generator were purchased. Travel costs to and from Switzerland would make up a large part of the additional cost, the report added.

The hearing was adjourned indefinitely when Mayor Cobo asked that Harlan and Burns & Roe present in writing the various points at issue. Harlan was authorized to use data from the Burns & Roe report for that purpose. Once the reports are in, the matter quite likely will get a hearing before Detroit's common council before a contract finally is awarded. And there the foreign competition pot will boil again.

TECHNICAL NOTES

ARCHER E. KNOWLTON

Insulation takes up 95% of the winding space in a 220-kv transformer and the copper conductors 5%. This leaves no doubt where to focus for space and cost reduction.

Burlap bagging and carton material (not unlike an improvised cot) were found in a turbine crossover pipe when start-up performance fell short of expectations.

Substation ground impedance measurements by conventional methods may entail relatively large errors if the ground is of low impedance and large area. Better accuracy calls for avoiding the mutual impedance between the so-called potential and current circuits.

Non-base-load stations functioning on an average load cycle can usually justify an adjustable-speed boiler-feed pump drive.

Every pole on an 80-mile 60-kv line was changed without de-energizing the circuit.

Polyethylene resin acquires desirable resistance to environmental cracking if it is compounded with about 10% of 40,000 molecular weight polyisobutylene.

Maintenance Costs Stay OFF When Your Street Lights Go ON

with New KEARNEY Mercury Relays

Now the new modified design with *no exposed moving parts* provides positive, trouble-free operation.

Easy-to-install Kearney Mercury Relays give added reliability to pilot wire control of either incandescent or mercury vapor street lights. Designed for use with either groups of individual lights or cascades of groups, this relay will *never require adjustment of any kind.*

Make and break of load current takes place between automatically renewed, clean mercury surfaces thus eliminating all scaling, pitting, burning and chattering of contacts.

The relay plunger is the only moving part. Operating in a hermetically sealed tube, it is positively non-sticking; unaffected by temperature, moisture or corrosive atmospheres.

Kearney Mercury Relays are available in either "normally open" or "normally closed" types.

Write Dept. K today for bulletin containing full information on application and operation of the units.

JAMES R. KEARNEY CORPORATION
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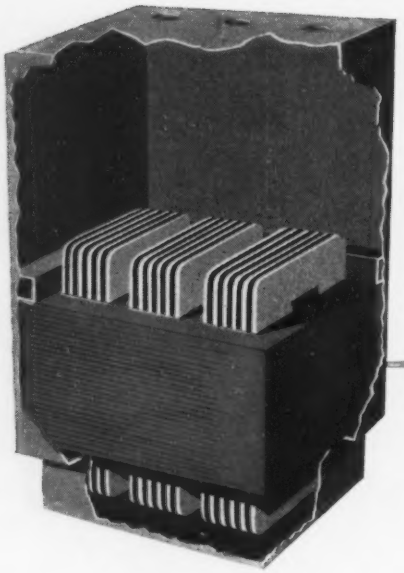
Kearney Products

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

For Better Construction . . . for **SAFER** *Maintenance*



This design under

50,000 kva, FOA, 3 phase, 60 cycle
Type UT, TCUL on low voltage
HV 132 kv Y, LV 72.5 kv Y, TV 13.8 kv Y.

offers more dependability all operating conditions

The Form-Fit design of Westinghouse Power Transformers gives added assurance of maintaining a high level of performance. One reason is that the core surrounds, supports and protects the coils, giving them added strength . . . both electrical and mechanical.

The laminations of the core are tightly clamped in position by channels welded to the inside of the tank. The area of the coils extending beyond the protection of the core is securely braced to the tank by hardwood wedges, and the individual coils are separated by oil-impregnated pressboard. This not only serves to maintain firm spacing between the coils, but also, because of the strategic positioning of the spacers, directs the flow of coolant for maximum efficiency.

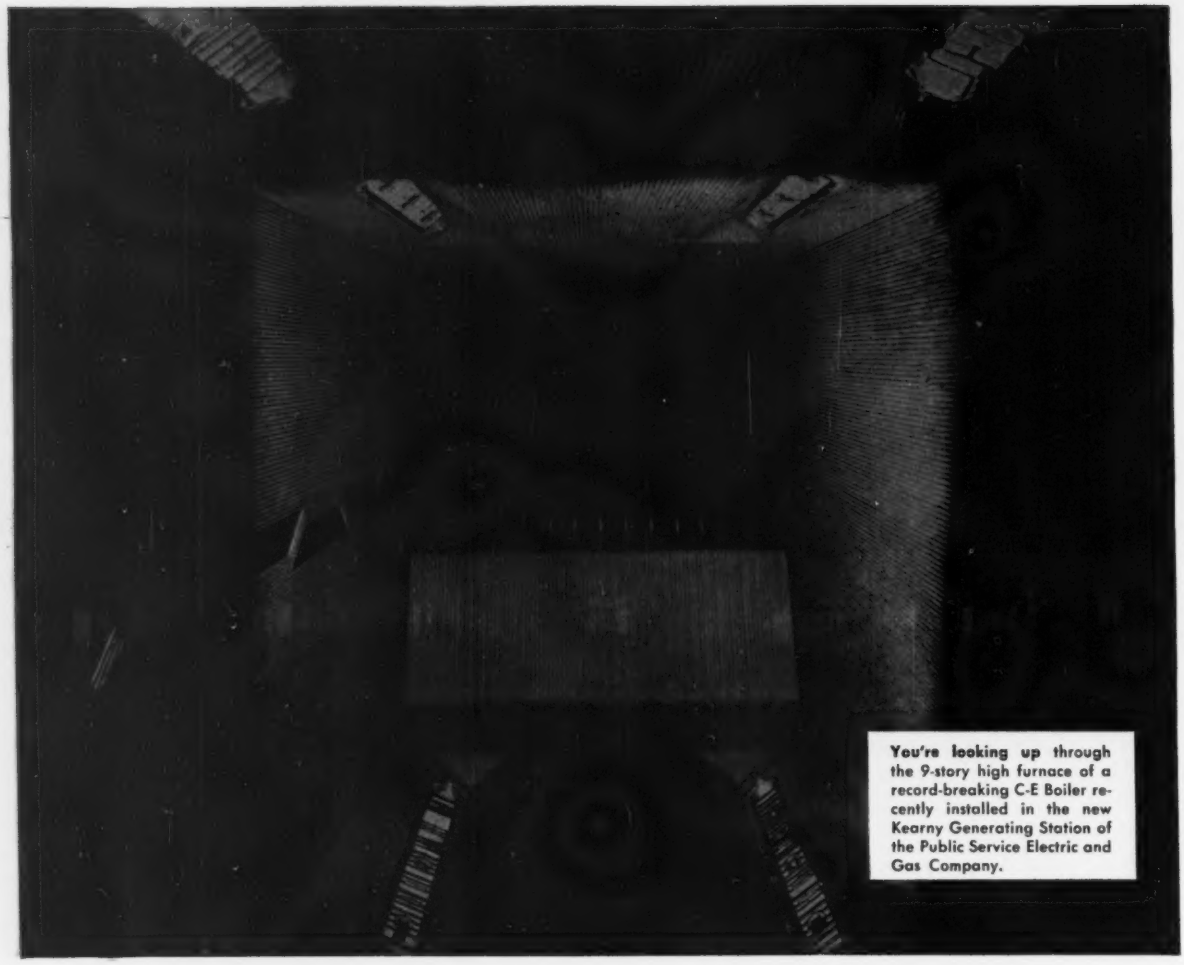
Form-Fit construction utilizes relatively few coils. High and low-voltage sections are interspersed, so that electromagnetic reaction of the sections is reduced. The net result is a design that has superior mechanical strength to withstand short-circuit stresses, yet properly distributes electrical surges.

Add to this the advantage of more efficient cooling, with lower temperature gradients, and it's easy to see why Westinghouse Form-Fit Transformers offer greater dependability under all operating conditions. Your Westinghouse representative will be glad to discuss the application of these transformers to your individual power problems, or write for Booklet B-4142-A. Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.

J-70640

YOU CAN BE SURE...IF IT'S Westinghouse

POWER TRANSFORMERS



You're looking up through the 9-story high furnace of a record-breaking C-E Boiler recently installed in the new Kearny Generating Station of the Public Service Electric and Gas Company.

Power history was "lighted off" here

When trial runs started in March at the new Kearny Generating Station of the Public Service Electric and Gas Company, Kearny, N. J.—history was made by this progressive utility.

And history was made by Combustion Engineering, too, for two "world's firsts" were set by the C-E Boilers serving the new Kearny station. For the first time a boiler generated steam at a temperature of 1100 F and for the first time, too, steam was delivered to a turbine at 2350 psi.

The two Kearny boilers are the largest controlled-circulation boilers ever built, each serving a 145,000 kw turbine generator.

That controlled-circulation has become the major new trend of American power practice is impressively revealed by the fact that in less than three years utility companies have ordered C-E Controlled Circulation Boilers to serve an aggregate power generating capacity of more than 5,000,000 kw.

B-678A

C-E

COMBUSTION ENGINEERING, Inc.

Combustion Engineering Building, 200 Madison Avenue • New York 16, N. Y.

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT

Niagara Bill Faces Delay 'til '54

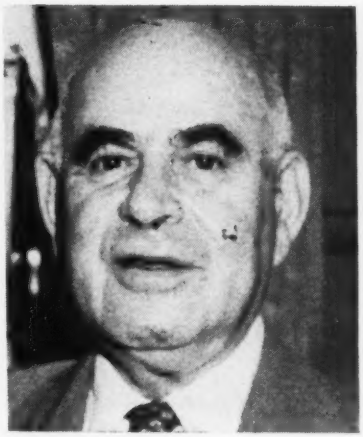
Senate action this year is called "highly improbable." Lehman threatens talkathon against measure backed by utilities

Whopping bi-partisan majority of the House voted electric companies one of their biggest legislative victory in years—approval to develop an additional 1.1 million kw of power at Niagara Falls.

The measure went to the Senate last week where favorable preliminary action seemed assured. However, most observers believed it "highly improbable" that the Senate would take final action on the bill during the current session of Congress. A crowded legislative schedule and a rush to adjourn by July 31 appears to preclude a Senate vote before next session.

And Senate leaders were put on notice that any attempt to get a vote on the measure this year would bring a full-fledged talkathon. Sen Herbert H. Lehman (D., N. Y.) supporting federal development, heads a group of 14 Senators who have agreed that the Niagara Power bill would call for "most detailed consideration" on the floor. The group includes Sen Wayne Morse (Ind., Ore.), two New England Republicans and 11 Democrats.

Dondero Leads . . . Lion's share of the credit for shepherding the bill through the House goes to Rep George A. Dondero (R., Mich.). He had introduced the bill, although Rep William E. Miller (R., N. Y.) had introduced one earlier. As chairman of the Public Works Committee, Dondero conducted the hearings and gained committee approval. On the floor, the Michigan Congressman managed passage of the bill.



LEHMAN hints at a talkathon

DONDERO guided bill in House

Opposition was led by Democrats, Robert E. Jones of Alabama and Franklin D. Roosevelt, Jr., of New York. Frank J. Becker (R., N. Y.) put up a token fight for state development. Federal development, backed by Roosevelt, was never even brought to a test vote.

The bill which passed the House by a 262 to 120 roll call vote would enable the New York electric companies to build the huge additional power plant on the U. S. side of Niagara Falls.

Opposition to the private enterprise bill all but crumbled with each succeeding test of voice and standing votes.

For the proponents of federal or state development, the action was a disastrous reverse following nearly two decades of gains. They never were able to consolidate their opposition or to offer a roundly-backed alternative proposal.

Test Votes . . . Tests leading up to the final vote tell the story:

- A substitute bill which would provide for state development of the Niagara power was defeated 17 to 136.
- Amendment which would have given public bodies and cooperatives priority to purchase power under the state development plan was voted down by a 55 to 128 standing vote.
- Amendment which would have inserted the preference purchasing clause into the private enterprise bill was shouted down by a voice vote.
- Provision of the private enterprise bill which would have permitted public bodies to take over the development after 18 years of operation was deleted by a voice vote.

Seaway Power

FPC grants license to New York to develop St. Lawrence. Opposition may appeal verdict

By unanimous vote, Federal Power Commission last week issued a license to the Power Authority of the State of New York for development of the St. Lawrence Power Project.

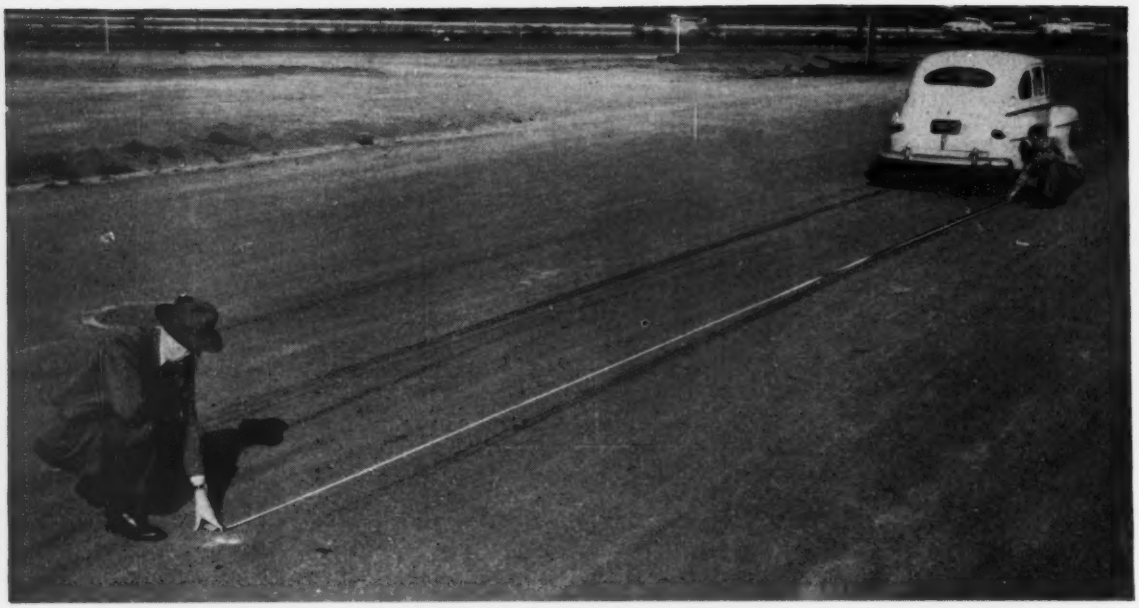
Opponents of the license are already busily engaged in bringing court action to upset the FPC decision, and experts say that actual construction of the $261-million project may be held up at least until next year.

Court suit to head off the FPC decision was brought by Public Power & Water Corp of Trenton, N. J., which filed a competing application. FPC motion to dismiss the suit was pending before a U. S. Court of Appeals at the time the license was issued.

Other Moves Expected . . . This was only the first of a series of court moves that opponents are expected to take. Both the Trenton concern and the Central Pennsylvania Coal Producers Association are believed to have sufficient status in the case to ask for an appeal to the courts.

Next move of the opponents would be to request a rehearing before FPC. This must be done within 30 days after issuance of the license. FPC has 60 days in which to decide on the rehearing. Should FPC deny the rehearing, as seems probable, next step would be a petition for review by the Court of Appeals.

Although the final draft of the commission order issuing the St. Lawrence license was not available early last week, it was expected to follow closely the recommendations of FPC Examiner Glen R. Law (EW, May 18, p. 128).



Showing a driver how far he'd skid is part of Pacific G&E's course aimed at . . .

Teaching Utility Drivers to Be Safe

E. F. HOCKENBEAMER, Safety Supervisor, Claims and Safety Dept, Pacific Gas and Electric Co, San Francisco, Calif.

A four-point program of driver training and testing has helped Pacific Gas & Electric Co to reduce progressively its frequency of avoidable accidents. And that, the company feels, pays a good return in good will and public relations.

Reduction in accidents has been achieved in spite of rise in vehicles in use and miles driven in California, both by the company and other motorists (See table below).

Based on accepted training and testing procedures, but including two innovations which encourage employees to practice better driving habits, the program has resulted in these benefits:

- Fewer accidents classified as avoidable involving a company driver.
- Ready acceptance by management and employees.
- Highly favorable newspaper publicity and strong endorsement by state and city traffic authorities.

Avoidable Accident Frequency Is Down at Pacific G&E While Vehicles and Usage Are Up

	1949	1950	1951	1952
For Pacific Gas & Electric Co*				
Vehicles registered	4181	4299	4794	5000
Miles traveled, millions	41.26	41.11	44.63	48.25
Avoidable accidents per 100,000 miles				
All divisions	1.86	1.74	1.64	1.60
Typical rural division	2.22	1.57	1.95	1.34**
Typical metropolitan div	5:63	4.52	4.86	4.18**

* Twelve months ending October, with 1952 estimated
** For ten months of 1952

Employees Conduct Tests . . . Included in the program are between 8,000 and 9,000 employees who are either regular or casual drivers. By the end of 1952 about 6,000 employees in the company's 13 divisions had participated. Tests are supervised by Claims and Safety Department but given by carefully selected and trained division employees.

These employees are grouped into "eye testers" who handle the visual phase only and "driver testers" who handle the balance of the program, or under certain conditions, the entire program. Most driver testers have backgrounds including experience as servicemen or truck drivers and in all cases have excellent driving records. While the company has done most of the training of these testers, in some instances they have taken a fleet supervisor's training course. This is a one-week program given annually by the University of California.

For each employee undergoing driver testing and training, program is given individually in four phases:

- Visual test to determine how well and how much he can see.
- Brake reaction test to determine how quickly he can stop, measured in distance.
- Driving test in heavy traffic to point out "potentially dangerous" driving habits.
- Coordination test to emphasize results of first three.

The visual test given in the course covers ability to see clearly, accurate recognition of colors, depth perception and field of vision or "side vision." Especially important

is side vision, the ability to see objects on either side while looking straight ahead. Side vision is checked with American Automobile Association's field-of-vision apparatus. By use of plywood "blinders" with this apparatus, testers show each driver how side vision is affected by speed. For example, normal stationary side vision of up to 180 deg can be reduced to 42 deg at 60 mph.

Side vision is stressed because the loss of it as speed increases accounts for such situations as other cars, pedestrians, or an animal, suddenly "appearing from nowhere" into the path of a moving car. A decrease in side vision prohibits driver from seeing changes in known or familiar surroundings—a newly dug trench, new traffic signs or lights, etc. Furthermore, side vision decreases as a driver concentrates on the road ahead. Thus a few seconds' concentration might result in a collision with some object approaching from the side.

To offset the natural limitations of side vision, these points are stressed to employees after the visual test:

1. Do not depend on side vision for protection.
2. Practice looking from side to side, "sweeping" the road ahead at all times.
3. Concentrate attention on driving.

Not Time But Distance . . . For the brake reaction test, PG&E has seven automobiles equipped with an AAA electrical detonator on the front bumper. At speeds of 15 and 30 mph detonator is fired by driver tester without notice to the driver. It signals him to stop and makes a small paint mark on the pavement at that instant. When the brake is applied, another paint spot is made.

After car is stopped, driver and tester measure distances from first and second spots to front bumper. By determining the distances himself, the driver is made aware of total distance the car travelled before it stopped. In this test, emphasis is placed on braking and reaction distances, rather than time, because the company has found distance makes a greater impression on drivers.

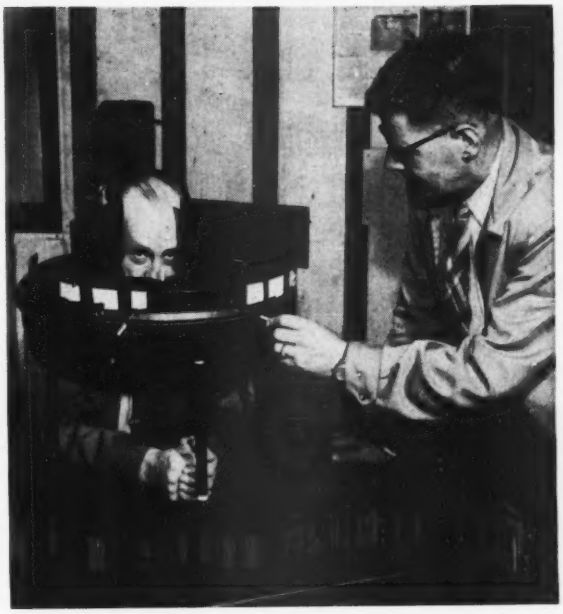
Third part of the program consists of a road test in downtown traffic to uncover potentially bad or dangerous driving habits. Drivers are encouraged to drive in their normal manner and are told they will not be graded or rated during the test.

Driver tester does not carry a check sheet but notes mentally any of seven bad driving habits—(See accompanying list). Poor habits are checked later on an AAA "Road Test in Traffic" check sheet and are mentioned in the coordination test which follows.

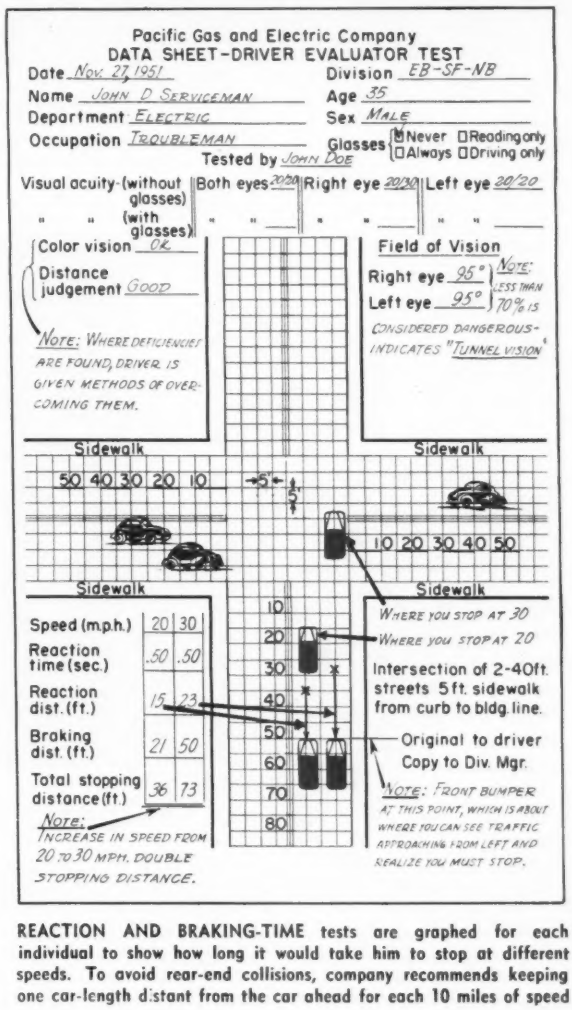
Coordination phase of the program is considered most important. It brings together all elements of the program.

Seven Most Common and Dangerous Driving Habits

1. Driving too fast for road, weather or vehicle conditions
2. Improper turning, including failure to look, signal and look again before turning
3. Following too closely
4. Failure to yield right-of-way, whether or not legally right
5. Failure to stop completely where required
6. Disregard for traffic conditions, signals or signs
7. Improper backing



TEST WITH "BLINDERS" convinces driver that his side vision narrows rapidly as his speed increases. Course teaches the student a remedy


Pacific Gas and Electric Company
DATA SHEET-DRIVER EVALUATOR TEST
Date Nov. 27, 1951
Division EB-SF-NB
Name JOHN D SERVICEMAN
Age 35
Department ELECTRIC
Sex MALE
Occupation TROUBLEMAN
Glasses ☑Never ☐Reading only ☐Always ☐Driving only
Tested by JOHN DOE
Visual acuity-(without glasses) Both eyes 20/20 Right eye 20/30 Left eye 20/20
(with glasses)
Color vision OK
Distance judgement GOOD
NOTE: WHERE DEFICIENCIES ARE FOUND, DRIVER IS GIVEN METHODS OF OVERCOMING THEM.
Field of Vision
Right eye 95°
Left eye 95°
NOTE: LESS THAN 70% IS CONSIDERED DANGEROUS-INDICATES "TUNNEL VISION"
Sidewalk
50 40 30 20 10
5'
10 20 30 40 50
Speed (m.p.h.) 20 30
Reaction time (sec.) .50 .50
Reaction dist. (ft.) 15 23
Braking dist. (ft.) 21 50
Total stopping distance (ft.) 36 73
NOTE: INCREASE IN SPEED FROM 20 TO 30 MPH. DOUBLE STOPPING DISTANCE.
WHERE YOU STOP AT 30
WHERE YOU STOP AT 20
Intersection of 2-40ft. streets 5ft. sidewalk from curb to bldg. line.
Original to driver
Copy to Div. Mgr.
NOTE: FRONT BUMPER AT THIS POINT, WHICH IS ABOUT WHERE YOU CAN SEE TRAFFIC APPROACHING FROM LEFT AND REALIZE YOU MUST STOP.

REACTION AND BRAKING-TIME tests are graphed for each individual to show how long it would take him to stop at different speeds. To avoid rear-end collisions, company recommends keeping one car-length distant from the car ahead for each 10 miles of speed

to show the driver how his test data relates to his driving habits.

No mention is made that the employee is either a poor driver or should be prohibited from driving.

Individual data for each driver from the three previous phases is reviewed. Copies of visual, road test, and reaction test data are given to him. Traffic habits checked during the road test are discussed. For each habit discussed, an attempt is made to give first a practical reason for its being checked. This is followed by a practical suggestion for its correction.

Defensive Driving . . . PG&E emphasizes a code of "defensive driving", which is worked into program:

1. When stopping to make left turns against oncoming traffic, stop with wheels straight ahead. Then if vehicle is struck from behind, it will move straight ahead and not into oncoming traffic on the left.

2. Backing accidents account for 25% of all avoidable accidents. Plan routes and stops to avoid backing.

3. Corner posts on all cars create "blind" spots. Where a full stop is required but not made, a vehicle or pedestrian can stay behind the "blind" spots and not be seen. In the second or two it takes to make a full stop, they will come into view.

4. When stopped at a signal-controlled intersection, stay out of gear and keep brake on tight until light is green. Keeping brake on tight will keep vehicle from being rolled into cross traffic if hit from the rear. It also braces driver against collision.

5. Use signal-controlled intersections on busy streets. It's easier to go around a block and cross at right angles than "fight" through a left turn.

6. Signal for any and all changes of direction or speed.

Follow-up Is Important . . . To keep employees safe-driving conscious after they have completed the program, the company sends out sheets of safe driving practices at intervals. Plans for re-testing at frequent intervals are also being drawn up.

At present, a majority of employees who drive have been covered by the program. Under consideration is a permanent program which may expand in extent and scope. Such a program could well include issuance of a company driver permit which would indicate specific vehicles the driver is qualified to handle.

Channel Cable Tests to Start

Britain, France begin trials this summer in connection with proposed submarine intertie between the two countries

LONDON (McGraw-Hill World News)—Submarine cable-laying trials will be carried out this summer off the south coast of England near Dover in connection with the proposed project for the cross-channel interchange of electricity, British Electricity Authority has announced (EW, April 14, 1952, p 32)

The Post Office cable-laying ship, the "Alert," will lay two half-mile lengths of cable of British manufacture, and these will be jointed at sea to a 300-yard length of cable provided by French manufacturers. After certain electrical tests the cables, joints, etc., will be recovered and returned to works for tests to demonstrate whether damage has occurred during the laying operations.

In France, a program is being developed for a sea trial of two to four sections of gas compression cable, each section being about 100 yards long. The cables will be laid off a jetty, in deep water, and jointed to form a loop.

Tests are to include loading cycles and direct current tests.

Following this, investigations will be made to study the practicability and sensitivity of different methods of locating a gas fault, made artificially at a known point. It may also be possible to test the maintenance of gas pressure and of penetration of sea water into the cable insulation under fault conditions during these studies.

It is expected that the tests will be completed early in 1954, when an official report on the main project will be drawn up.

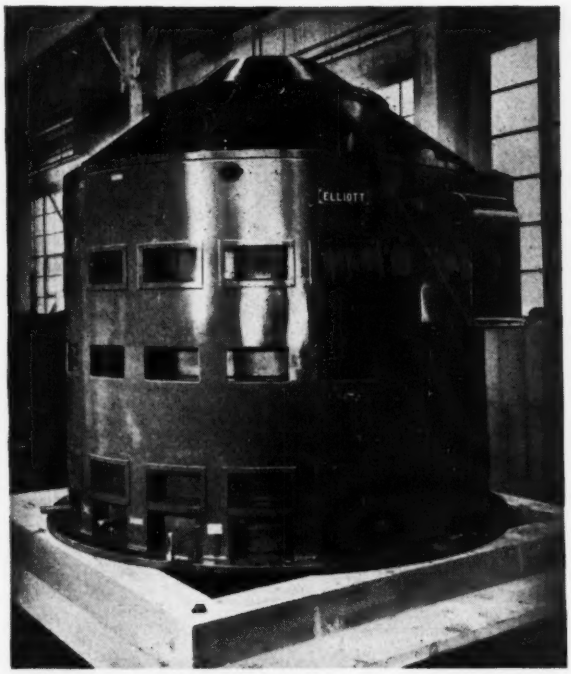
Main project comprises a 132-kv cable circuit, laid between Dover and Calais, and connected into the British 132-kv system on the one side and the French 90- and 225-kv systems on the other. The cable

(*Continued on page* 20)

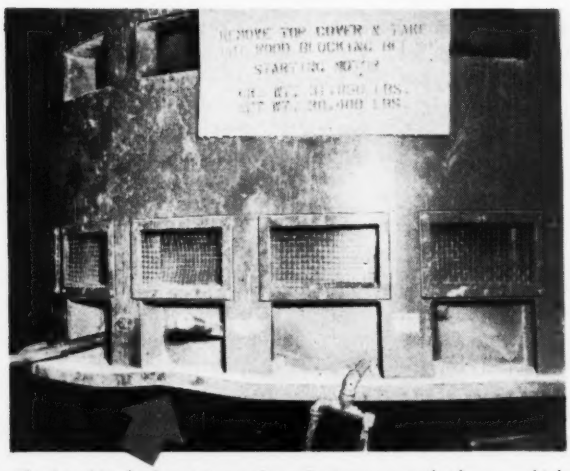
Winning Entries in Lamp Contest

Lamp contest judge Donald P. Caverly, Sylvania Electric Products, points out a feature of the first award lamp to the other judges James H. Jensen (center) General Electric Co, and Miss Edith L. Buckholtz, Westinghouse Electric Corp. The contest was sponsored by Central Hudson Gas & Electric Corp for high school students. Students in 35 high schools in Central Hudson Valley participated in the competition.

What happened when a 15-ton motor dropped 25 feet!



The motor, good as new, after required repairs and repainting.



The bend in the base ring—the only damage to the frame, which upon disassembly checked absolutely true on the boring mill.

Construction accident conclusively proves the enduring rigidity of ELLIOTT Fabri-Steel motor construction.

It hit with a smack that shook everything for a hundred yards around, when the crane accidentally let go of this big Elliott 2000-hp, 8-pole vertical induction motor while the motor was 25 feet in the air, during installation at a southwestern utility plant. Customer's engineers, witnessing the accident, assumed 100 per cent loss of the motor.

Not so with an Elliott motor with its all-welded steel frame and stator. For here's all that happened to it:

No damage to internal parts of stator or rotor.

Base ring bent between two ribs — easily corrected (see photo).

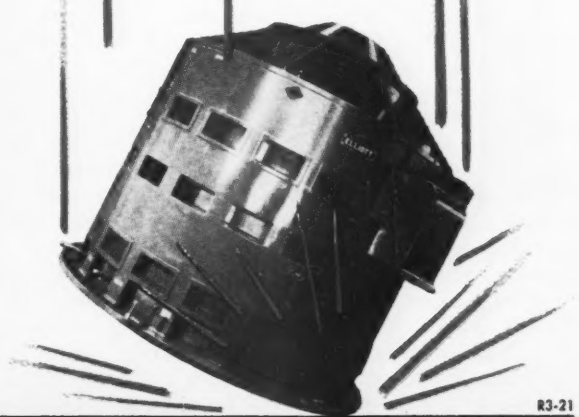
Shaft bent .0034 in. — readily straightened.

Rotor driven up into motor, but stopped by heavy bracket.

Lower oil pot, one baffle, and top cover only needed replacement.

Minor damage to Kingsbury thrust bearing and upper guide shoes. No damage to bottom guide bearing.

And that's all. A demonstration of shock-resistance that would do honor to an army tank. If you want real stiffness in a motor, check on Elliott Fabri-Steel construction — see your local Elliott engineer or write Elliott Company, Ridgway, Pa.



R3-21

Elliott FABRI-STEEL MOTORS AND GENERATORS

ELLIOTT Company RIDGWAY DIVISION

FOR MOTORS 1-200 HP. CROCKER WHEELER DIV. AMPERE, N. J.

Channel Cable

(*Continued from page* 18)

circuit would be made up of three single-core cables, with possibly a fourth to spare.

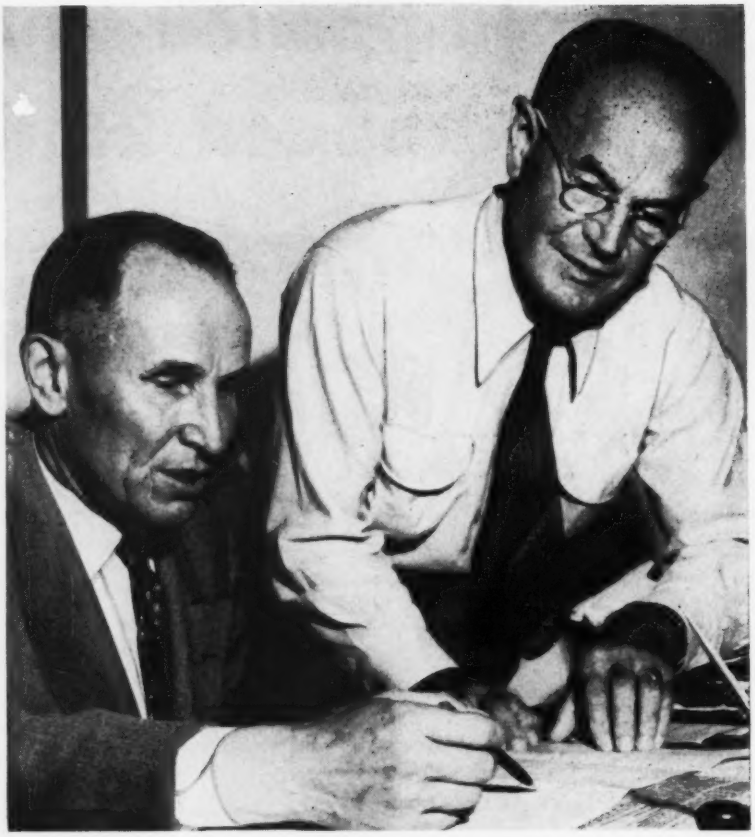
The development program to be undertaken is expected to include the following:

- Construction of sample joints and lengths of cable; electrical and mechanical proving tests at manufacturers' works;
- Trial installations at sea, involving the preparation, laying, dielectric testing, artificial loading, repairing and recovery of jointed lengths of cable;
- Objective investigation of methods for surveying the route, for precise determination of the position of the cable as laid, for locating possible gas leaks and for grappling the cable to be picked up;
- Examination of methods of laying the cables;
- Investigation of methods of repair under working conditions.

Two types of cable are to be the subject of investigation—the external gas compression cable and the pre-impregnated gas pressure cable. The former is being tested because of its high inherent electric strength and the apparent extra security against damage provided by the two lead sheaths, and the latter because of its simplicity and the possibility of manufacture in long sections.

In Britain attention has been mainly concentrated on the pre-impregnated gas pressure cable, and in particular on the manufacture of sample lengths of suitable armoured cable, of flexible joints with a diameter not exceeding that of the cable proper, and of rigid joints suitable for expeditions repair at sea. These components will be subjected to rigorous mechanical and electrical type tests in the works. In France similar work is being undertaken on two designs of external compression cable and two designs of pre-impregnated pressure cable.

In addition, Electricite de France is to carry out, at its Fontenay Research Center, severe mechanical and electrical tests on lengths of both types of cable and on joints. Samples of each type of cable, about 125 yards long, will be subjected, while connected direct to the French 225-kv system, to long duration stability tests under artificial loading cycles.



CLYDE SPENCER (left), going over plans with chief aide Robert S. Calland, is . . .

New USBR Boss on Coast

Clyde H. Spencer, who supervised building of Hungry Horse Dam for the Bureau of Reclamation, has stepped into a new, tough job. It is to carry out the Republican Administration's plans to reorganize the bureau's Region II office in Sacramento, Calif.

Spencer replaces Richard L. Boke, controversial figure in USBR-developed water and power projects in California, who resigned as regional director one day before reorganization plans were announced by Interior.

New Start . . . To give Spencer a clean start, the Region II office was abolished and replaced by the California Projects Office, to operate in California and a portion of Oregon. Spencer's title is that of supervising engineer.

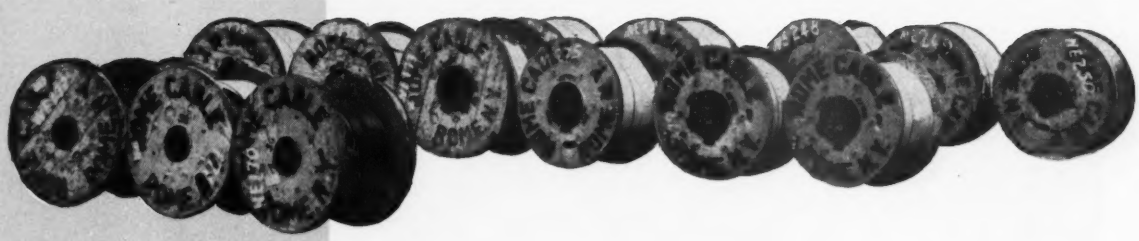
Some of the changes proposed include abolition of the bureau's power branch, elimination of district offices in cities in California's central valleys, and discontinuation of Sacramento River water rights studies.

Spencer said he plans to approach the reorganization in an "orderly fashion . . . to fit the present Administration's policy."

"I can't tell exactly what it is except I was told repeatedly the bureau has been in too much promotion activity," he said. "I want a full opportunity to make my own appraisal of what changes should be made. I'm not ready to set any figure on possible cuts in personnel."

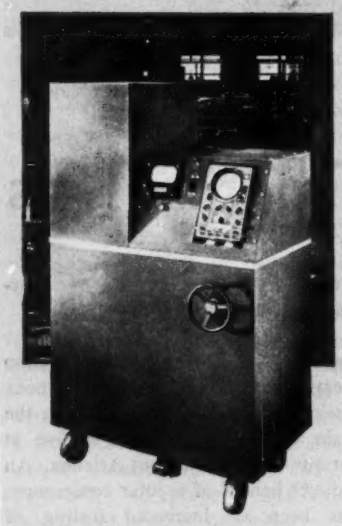
During recent years, under the regime of Reclamation Commissioner Michael Straus and Boke, the bureau office in Sacramento was charged with being a "propaganda agency." California Congressmen also complained the staff was "top heavy" and questioned the economy of the office's operation.

Spencer began his career with USBR in 1919, after serving with the 2nd and 5th Engineers Divisions in France during World War I.



Every foot of RoZone-RoPrene power cable on these reels was corona level tested to assure dependable operation in one of the nation's biggest steel mills. This standard factory testing procedure is one of the big reasons why Rome insulated cables are specified for many critical jobs.

Rome's Corona-Ionization test gives *extra* protection



Specially designed ionization detector for routine factory use measures corona level of all high-voltage rubber insulated cables.

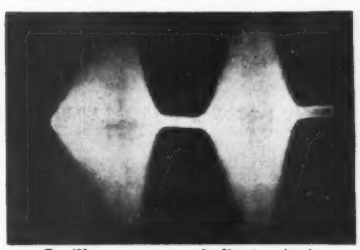
Perhaps you have had the costly experience of installing a reputably high-quality rubber insulated power cable manufactured by a reliable supplier . . . only to have it fail prematurely for apparently no good reason.

Yet, one of the major possible reasons could be . . . internal ionization. This hazard is caused by electrical breakdown of air within the insulation, or especially where it has not been closely fitted to the conductor surface or shield.

Several destructive effects may result from ionization. Included are possible ozone cutting, reduced dielectric strength, and a substantial increase in dielectric losses. *And there is no way of detecting ionization through the visual, physical and routine electrical tests usually applied to cables.*

But you can depend on maximum protection against ionization when you specify Rome power cables. *Every foot of Rome insulated cable, rated at 3000 volts or over, is thoroughly tested by a specially designed ionization detector.* This instrument accurately measures the corona level of the entire cable to assure the ionization voltage exceeds the intended operating voltage of the cable.

This is one more extra step in Rome Cable's standard manufacturing procedure that assures dependability. This completely *NONDESTRUCTIVE* method of testing was developed by Rome Cable engineers and was first described in AIEE paper 48-198, "The Measurement and Investigation of Ionization Level of Rubber Insulated Cables," presented in August, 1948.



Oscilloscope trace indicates ionization within an insulated cable.

It Costs Less to Buy the Best

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ROME CABLE CORPORATION, Dept. EN-7, Rome, N. Y.
Please send me a copy of ..... AIEE paper 48-198
..... Rome Power and Control Cable Catalog.

Name.....
Company.....
Address.....
City.....Zone.....State.....

At problem-solving conferences like this . . .

Arizona Supervisors Train Themselves

KEITH TURLEY, Welfare and Training Director, Arizona Public Service Co, Phoenix

Under a program of supervisory conferences established by Arizona Public Service Co. supervisory personnel are guided and developed into better managers while they simultaneously discuss and provide solutions to current problems and procedures which are a part of present-day power company operation.

Need for developing and training supervisors was evidenced by the fact that company employees grew from about 500 to over 1,300 during 1945 to 1949. Supervisory personnel experienced a similar growth. It was recognized that supervisors hadn't had much time to learn what they would have liked to about company policies, procedures and problems.

Eight Objectives . . . To meet these needs, a program was laid out in 1950 with eight objectives which are listed on page 23. Program was set up on the assumption that conditions within the industry, and within the company, would continue to change. Therefore, need for supervisors conferences will be continuous—the program has no time limit.

Included in the program are all supervisors, including top management, placed into 19 groups consisting of from 10 to 16 personnel. One group, for instance, consists of the president, supervisors from customer service, electrical construction and general accounting, director of publicity and publications, foremen from steam plant maintenance and electrical service, system gas superintendent, one electrical and two gas foremen, district manager, local area manager, consulting engineer and engineering section head. Diversification of positions and experience within each group has made for the most effective atmosphere in which to consider various topics.

It was felt at the outset that opinions and conclusions from one supervisor, or from several members of one department, could be biased and one-sided. On the other hand, a composite opinion from the entire cross-section of supervisors would be a fair, accurate and intelligent solution to the particular problem. During discussions all ranks or authority are removed. Opinions and observations are held confidential and are forwarded as group opinions only.

Regular Conferences . . . Each group meets every six weeks for a two-hour session. Fourteen groups meet in the main office at Phoenix and five at various cities throughout Arizona. An indirect benefit of regular conferences has been an increased feeling of confidence on the part of many supervisors toward assistants left in charge of sections or crews. After a few conferences, most supervisors felt their department could carry on satisfactorily if an emergency forced them to be absent.

Beginning with each conference-year, every group selects one of its members to serve as group leader and as member of a steering committee. This committee aids in selection of subjects to be discussed by all groups and adjusts program policies and operation as necessary. Steering committee meets at least twice prior to regular sessions to choose and discuss the next subject.

First Problems Discussed . . . A survey at the first group of conferences determined which problems were most

pressing and therefore required immediate action or discussion. It is perhaps significant to note that among the first subjects listed for discussion were the company's system of merit review, fundamentals of good supervisory management, company organization, employee benefits with emphasis on pensions, and manner of establishing new procedures. Discussion of the merit review system was requested because it was generally felt the system was imperfect, knowledge was lacking as to how it was supposed to work, and there was misunderstanding on the part of supervisors as to the necessity of carrying out its provisions.

How to Be Better Supervisors . . . Fundamentals of supervisory management were felt necessary to fulfill a desire of conferees to learn how to be better supervisors and to improve personal relationships with those above and below them in authority. Manner of setting up new procedures was in need of revision because of the former practice of installing procedures without first submitting plans to departments affected. It was agreed this practice was a source of much inefficiency, annoyance, and irritation in the field of personnel relations.

As new subjects are chosen, a conference paper containing the best materials available is prepared by the personnel department. This paper is sent to each supervisor well ahead of this scheduled session to give him time for constructive thought and the opportunity to prepare and bring materials of his own choosing.

At the close of each conference, conclusions and recommendations are summarized. Master summary from all 19 groups is prepared and offered to top management for its consideration and action.

A copy of this summary is mailed to all conferees and a condensed version is published in the employee newspaper. Wherever possible, supervisors hold meetings with their department or crew to pass along pertinent information from conferences. These practices tend to stimulate interest in conference subjects among non-supervisory employees who in turn request further information from their supervisors.

Two Important Factors . . . Success or failure of the conference method is based on two factors. These are the manner in which conferences are conducted and the adequacy with which conference leaders are chosen and trained. How meetings are conducted can be illustrated by the conference which dealt with the subject of employee training. A paper sent to supervisors prior to meeting date set forth the conference objective—to determine and evaluate specific types of training used by the company, and to investigate how this training meets the existing need and if additional training is desirable.

First part of the conference was given over to a discussion of the paper led by group leader. He pointed out why management feels employee training is important. Then he listed on a blackboard an outline of the discussion plan—review principles in paper; review preliminary survey of existing training; evaluate and classify present training; and determine actual needs and if more training is required to meet them.

During review and discussion of the paper, group leader encouraged each conferee to participate actively by having him read or summarize a principal section of the paper. Then the leader guided discussion to indoctrination of new employees and present training for employees. Training for supervisors was introduced into the discussion. Then a five-minute break for coffee allowed conferees to warm up further to the subject by talking it over informally with each other.

Second part of the meeting was devoted to development of specific training needs and what could be done to meet them. Suggestions approved by the group were summarized and included with suggestions from the other groups for presentation to top management. As a direct result of the conference on employee training, several recommendations made to management were put into action. In this conference, as in all others, there were numerous recommendations, ideas, beliefs, views, comments, and suggestions expressed.

Group Leaders Elected . . . Leaders for conference groups are selected by nomination and election at the beginning of each year. Whether by accident or not, those chosen as leaders almost without exception are also opinion leaders and solidifiers of group action in their respective departments or work areas. At present, there is no formalized conference leading program for group leaders. Instead, they receive training as conferences proceed.

During the first half of the two steering committee meetings prior to each conference, group leaders study techniques of conference leading and group action. During the last portion of the first steering committee meeting, leaders choose the subject for the next series of conferences. During the last half of the second meeting, held after the conference paper has been printed, leaders actually participate in a trial conference on the subject to prepare them for forthcoming conferences.

So rather than participate in an intensive course on conference leading, group leaders have their training spread out over an entire year. While some leaders exhibit weaknesses when they start out, at the end of the year most group leaders can readily conduct a worth-while and effective conference. Experience has shown that leaders develop their own abilities in this practical manner.

In Retrospect . . . For others who would set up a similar program, here are several factors Arizona Public

Supervisory plan has these goals:

Better service to customers

Better understanding of policies by employees

Development of managerial personnel

More harmony in labor-management relations

Appreciation and promotion of free-enterprise system

Reduction of costs, accidents, and labor turnover

Closer tie between outlying divisions and central office

Better two-way communications between management and employees

Service considers most important.

Do not permit too great a time lag between conferences. Keep them continuous and coming up regularly.

Make sure all supervisors realize that top management wholeheartedly backs the program.

When ideas of paramount interest arise, particularly those affecting policy and procedure, give them close follow-up. Where necessary, top management should supply written comments and notice of what action will be taken.

Whoever administers the plan should have the sole responsibility for its operation. He should receive special training in the technique of group leadership and dynamics.

Learn to distinguish between "gripes" and constructive criticism—yet give personal attention to and follow-up both. Each department head should be responsible for following-up minor items discussed relating to his department. At year end, schedule a series of conferences to summarize and inventory what has been accomplished. This will help point out to participants problems they have solved as members of management.

About once each year schedule a conference on the subject "What's Your Problem?" Such a wide-open conference has no limits as to the subjects for discussion.

Rotate top company officers through all conference groups so that supervisors will get to know them better.

Results: Will this program get results? Well, at Arizona it has. Management there offers this list of improvements that came as a direct result of the supervisory conferences:

1. Complete revamping of merit review form and adoption of major changes in plans, procedures and policies of the system.

2. Establishment of a management committee on new procedures to guide their installation and impact on company operations.

3. Establishment of an internal auditing section in treasury department to follow through on procedures, locate areas needing strengthening and improve procedures in use.

4. Overhaul and realignment of safety board and committee activities.

5. Establishment of a new principle of safety which spells out company's responsibility, safety section's, and foreman's responsibilities.

6. Adoption of a new group hospitalization insurance plan which encompasses greater benefits at increased cost to company and employees.

7. Adoption of new electric construction standards.

8. Publication of new organization charts and spelling out of titles and functions to define areas of authority and responsibility.

9. Establishment of a new employee indoctrination program and changes in linemen and electrician apprenticeship training.

10. Formulation of plans for an employee information program to cover such subjects as human relations, company products, improvements of safety, leadership, organization, economy, and labor relationships.

11. Establishment of traffic control section which now coordinates movement of personnel, supplies and equipment throughout the service area at great savings.

12. Rewriting of work authorization procedure to reduce paper work, decrease the time element and streamline approval procedure.

13. Operating supervisors now play a greater part in establishing management's position in labor negotiations.

14. Publication of safety reports, actions, and findings of the safety board. In addition, several employee handbooks on benefit plans, insurance, personnel policies, etc, are being scheduled for rewriting and republication sometime during this year.

Changes in Capacity Reported to FPC

PLANT ADDITIONS DURING MAY

State	Utility	Plant	Fuel	Capacity (kw)
N. J.	Jersey Central Power & Light Co.	South Amboy	S	62,500
Ohio	Cleveland Department Light and Power	Lake Road	S	25,000
Iowa	Municipal Utilities	Spencer	S	5,000
Mo.	Union Electric Co. of Missouri	Meramec	S	110,000
Va.	Virginia Electric & Power Co.	Portsmouth	S	90,000
Ark.	Arkansas Power & Light Co.	L Catherine	S	99,000
Tex.	Burkburnett Municipal Power System	Hardin	IC	900
Tex.	City Public Service Board, San Antonio	Leon Creek	S	60,000
Tex.	Dallas Power & Light Co.	Parkdale	S	65,000
Wyo.	Jackson Hole Light & Power Co.	Jackson 3	IC	560

PLANT RETIREMENTS DURING MAY

Mich.	Consumers Power Co.	Reed City	H	150
Mich.	Marshall City Water & Electric Works	Marshall	IC	400
Neb.	Municipal Light Plant	Callaway	H	55
Neb.	Municipal Light Plant	Callaway	IC	128
Tex.	Burkburnett Municipal Power System	Hardin	IC	350

H—Hydro, IC—Internal Combustion, S—Steam

United States Capacity as of June 1—Hydro, 20,848,535 kw; Internal Combustion, 2,121,547 kw; Steam, 61, 362, 651 kw; Total, 84, 332,733 kw.

Philadelphia Electric Pays Fine for Smoke Violation

The Philadelphia Electric Company was fined $100 and costs July 7 after being charged with violation of the city's anti-air-pollution ordinance. The case was an outgrowth of a mechanical failure at the utility's Delaware Station at Beach and Palmer Streets, in the northeast section of the city. Residents complained that as a result of the failure, the inside and outside of their homes were covered with an oily soot. The incident occurred on June 22.

The company said the failure was purely an accident and the situation has been corrected. No technical details, however, were given on the failure at the plant which caused the air pollution. There was no testimony at the hearing. A representative of the Philadelphia Electric arrived at the hearing with a check for $109.95 and handed it to the magistrate in the one-minute hearing.

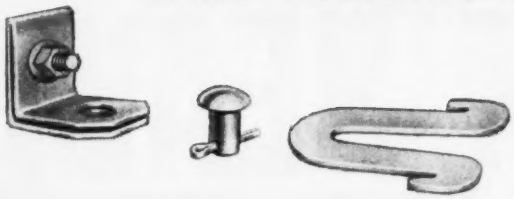
The charges against the utility were brought by the City Solicitor's office at the request of George J. Richers, acting chief of the Division of Air Pollution Control, of Philadelphia's Department of Health.

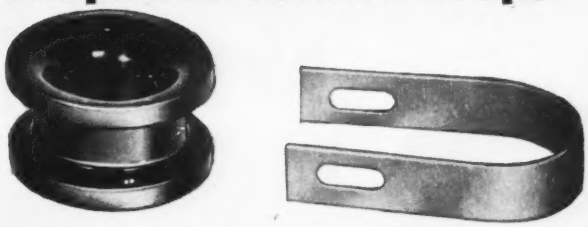
The company was charged with violation of the air pollution control ordinance of 1948. The $100 fine was the most that could be levied under the law.

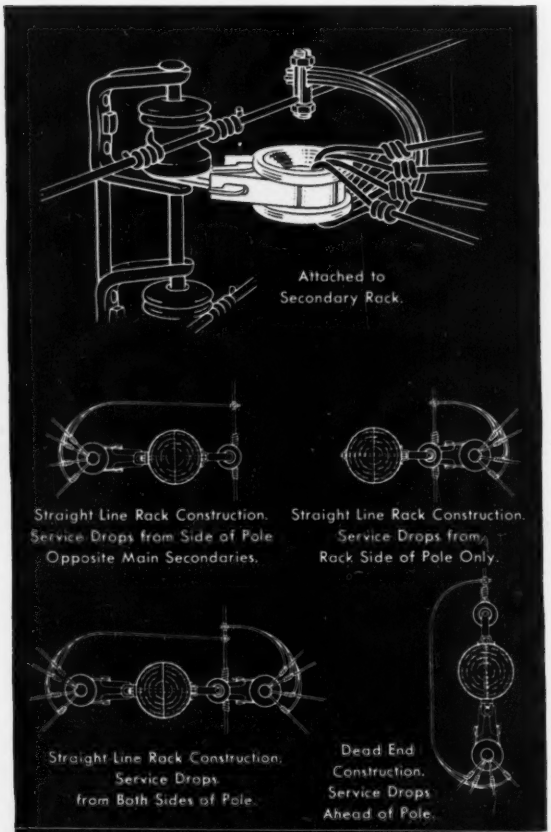
LINE CONSTRUCTION BLUEPRINTS

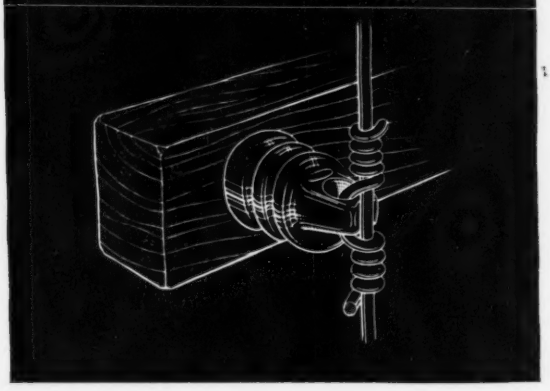
HOW SOME UTILITIES ARE MAKING CONSTRUCTION WORK EASIER . . .
IN WAYS THAT MAY BE HELPFUL AND USEFUL TO YOU.

L-M's Versatile Take-Off Insulator Simplifies Service Drops






Attached to Secondary Rack.
Straight Line Rack Construction. Service Drops from Side of Pole Opposite Main Secondaries.
Straight Line Rack Construction. Service Drops from Rack Side of Pole Only.
Straight Line Rack Construction. Service Drops from Both Sides of Pole.
Dead End Construction. Service Drops Ahead of Pole.

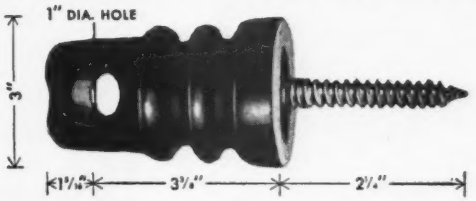


With the L-M Take-Off Insulator, it's much easier to install service drops. The Take-Off eliminates overloading of secondary rack spools and tangled connections. May be attached to secondary racks or directly to the pole. Simplifies installing, replacing, removing, or changing service drops; simplifies the operation when main conductors are replaced.

Easily used on either old or new construction. On old construction the yoke is just slipped under the rack spool, band is placed around insulator and snapped onto the yoke. Then service wires are transferred to the porcelain ring. Blueprints at left and below show some suggested uses.

Steel parts are heavily galvanized. Wet-process porcelain insulator has a 4" outside diameter with a 1½" diameter center opening. Available for pole or rack mounting; pole face attachment and insulator available separately. Ask the L-M Field Engineer for a sample.

L-M INSULATED PRIMARY LEAD BRACKET



A variety of applications. Many utilities find it particularly useful on crossarms to train primary and series street lighting leads. Wet-process brown glazed porcelain insulator 4 11/16" long, 3" diameter, with 2¼" No. 22 galvanized-steel wood screw.

Many L-M Construction Materials to Help Solve Your Problems

L-M offers a wide variety of Line Construction Materials and Specialties to help simplify your construction jobs. Ask the L-M Field Engineer for literature; or write Line Material Company. Explain your problem and we'll be glad to make suggestions. Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL

Line Construction Materials LM®

WIDE ACCEPTANCE

of these L-M HEAVY

50 amperes, 8000 amperes interrupting capacity

100 amperes, 14,000 amperes, interrupting capacity

200 amperes, 20,000 amperes interrupting capacity

Two years ahead of other manufacturers, L-M announced a line of heavy duty "PHD" fuse cutouts with interrupting capacities up to 20,000 amperes. Today, their wide acceptance all over the country proves the need for these cutouts designed especially for heavy duty service.

Here is the first complete line of cutouts for high capacity distribution feeders—designed and built especially for heavy duty service.

Reasons for This Wide Acceptance

Here are some of the reasons why these Line Material "PHD" (porcelain heavy duty) cutouts have been so widely accepted:

1. L-M was first in the industry with a complete line of heavy duty box cutouts having realistic and usable interrupting capacities:

2. Users have confidence in interrupting capacity ratings assigned.

3. Elaborate and detailed testing was conducted over a two-year period prior to manufacture.

4. L-M has paid special attention to the largest and smallest of design details, such as cementing, contact alignment, door and cartridge positioning—all of which govern successful cutout operation.

5. "PHD" cutouts are safe to use. They interrupt high fault currents successfully and eliminate danger of exploding porcelain.

6. These cutouts are designed to clear high fault currents as well as low fault currents, thereby insuring service continuity. *"PHD" is a Line Material Company trademark*

PROVES THE VALUE

DUTY CUTOUTS

50 amperes, 4000 amperes, interrupting capacity

100 amperes, 8000 amperes interrupting capacity

Customers Like HD Cutouts

From three utility companies who are using "PHD" cutouts come these comments:

"We're ordering nothing smaller than 100 ampere boxes and no cutout with less than 10,000 amperes interrupting capacity."

"We've standardized on the 5000/8000 ampere rating for overall use—in close to substations, the 'PHD' 100 ampere cutout with 10,000/14,000 amperes rupturing capacity will be used exclusively."

"The 'PHD' 200 ampere cutout with up to 20,000 amperes interrupting capacity certainly helped us out of a jam. We use it to protect feeders tapped off high capacity busea."

Here's Complete "PHD" Line

5 kv Rating	Interrupting Capacity rms amperes	
	2.5 kv*	5 kv**
50 amps.	8,000	5,000
100 amps.	14,000	10,000
200 amps.	20,000	15,000
7.5 kv	Interrupting Capacity	
50 amps.	4,000 amperes	
100 amps.	8,000 amperes	

*2.5 kv or line-to-neutral 4160 or 4330 volts Gr. Y. **5 kv or line-to-neutral 8330 volts Gr. Y.

Get Complete Information

If you aren't already using "PHD" cutouts, ask the L-M Field Engineer for a Bulletin; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL

fuse cutouts and fuse links

131

WE SMASH A CARLOAD OF SUSPENSION INSULATORS A MONTH . . . JUST TO BE SURE OF A CURVE!

This may seem strange - - one of the biggest users of O-B suspension insulators (a carload a month on standing order) gets them for nothing and merely smashes 'em up!

Enough suspension units to build some 20 miles of 69-kv line, each month, go to our laboratory for destructive test. Such extensive research makes possible the location of a truly representative number of points on a characteristic curve of normal distribution, and permits scientific statistical analysis of production.

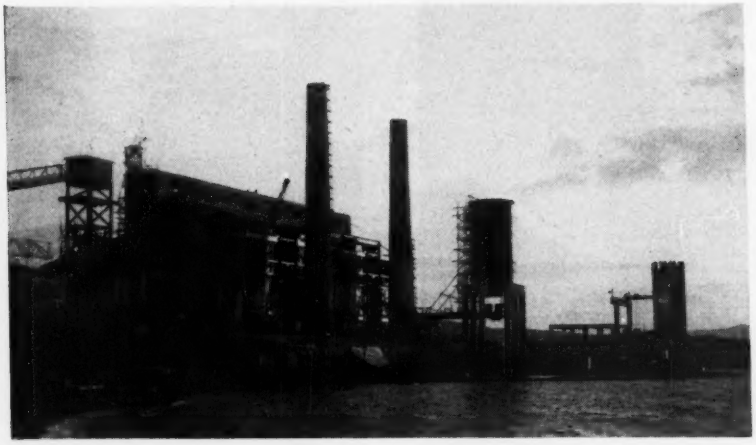
Such costly vigilance pays off by taking guess-work out of a product whose primary virtue is dependability. Because *we* won't guess at the quality of O-B suspension insulators, *you* don't have to.

Ohio Brass

MANSFIELD OHIO, U.S.A.

IN CANADA: CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4390-H



ALIVERI PLANT, shown while still under construction, is first project in program to go on line

Greek Thermal Plant on Line

One of two 40,000-kw units at Aliveri Station is now in operation. Installation is part of extensive program

Early this month Greece's new Aliveri steam station, located on the island of Euboea, went on the line adding 40,000 kw in capacity to the nation's power system. The plant's second 40,000-kw unit will go into operation this fall.

The Aliveri plant, built by Burns & Roe, New York, will burn lignite as a fuel. There is a large amount of lignite on Euboea and mines are being developed to supply the plant.

The new plant is just one part of a $100-million program, in which many nations are participating, to increase Greece's deficient power supply. At present Greece has the smallest per capita consumption of electricity of any country in Europe. Average yearly consumption is less than 100 kwhr.

Hydro Plants . . . Three other plants, all hydroelectric, are now under construction and will add another 140,000 kw during 1954. These plants are Louros on the Louros River in west central Greece, 50,000 kw; Agra, near the Yugoslavian border, 40,000 kw; and Ladhon, on the Ladhon River in the Peloponnesus, 50,000 kw.

In addition to the plants, 700 miles of 150-kv, single circuit, steel tower transmission lines are being constructed. The sections between Athens and Aliveri and Athens and Patras already have been completed. Good progress is reported on the Ladhon-Corinth and Agra-Salonika lines. Two types of line are being built, a heavy line with 636 mcm ACSR conductors on the main lines between plants and load centers and 336 mcm ASCR on the light type for the territory-covering circuits.

Nineteen receiving substations also are being built which will step down power from 150 kv to 15 kv. Sixteen of these are of sizes from 3,000 to 10,000 kva, two are of 40,000 kva, and one of 80,000 kva.

Many Nations Participate . . . The electrification program has been an international venture. In 1949 under the Marshall Plan, Ebasco Services, Inc, New York, made a survey of the economy of Greece to determine how to develop a power system which would use the nation's own limited resources. As a result of a year-long investigation the present program was outlined.

Financing of the $100-million program has been split three ways—one-third of the money is being advanced in direct aid by the United States through Mutual Security Administration and the rest, in about equal amounts, by Greece and by Italy in the form of reparations.

Equipment for the various projects is being supplied by contractors in the United States, West Germany, Italy, England, France, Switzerland, and Greece.

Lebanese 'TVA'

U. S. experts will propose program which will provide 114,000 kw of capacity

BEIRUT (McGraw-Hill WORLD NEWS)—A 22-man U. S. Bureau of Reclamation team on loan to Point 4 here is readying a final report on its $1-million investigation of the Litani Project, a Lebanese-size TVA. It will propose three major dams, five power plants, and 28 miles of tunnels to irrigate 50,000 acres of land and generate 114,000 kw.

Control point of the 50-ft wide Litani River, Lebanon's largest, will be the Karaoun Dam, 2,800 ft above sea level in the Lebanon mountains. The rockfill dam will be 180 ft high.

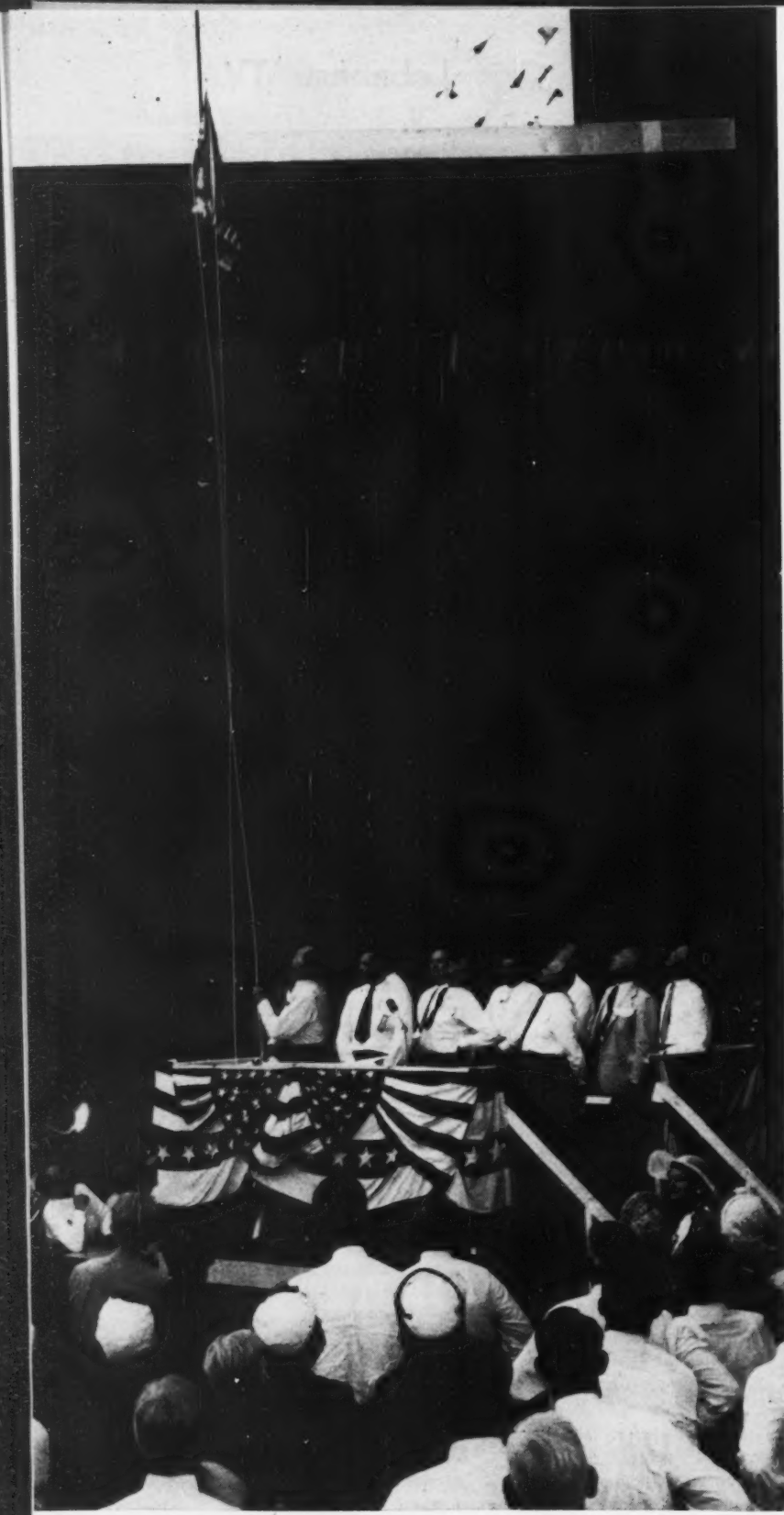
An arm of the project going directly west begins with a 5½-mile pressure tunnel from the reservoir through the mountains. Water from this will drop 1,300 ft into the 28,000-kw Bisri power plant.

From here water will collect in the 70,500 acre ft Bisri reservoir to be formed by constructing an earth-fill dam, 180 feet high. The Awali Tunnel, 1.8 miles long, will carry water to a 740 ft fall into a 36,000 kw plant. Water then will be diverted by a low dam into the Joun Tunnel, 4 miles long, to a 600 ft fall into a 24,000 kw power plant.

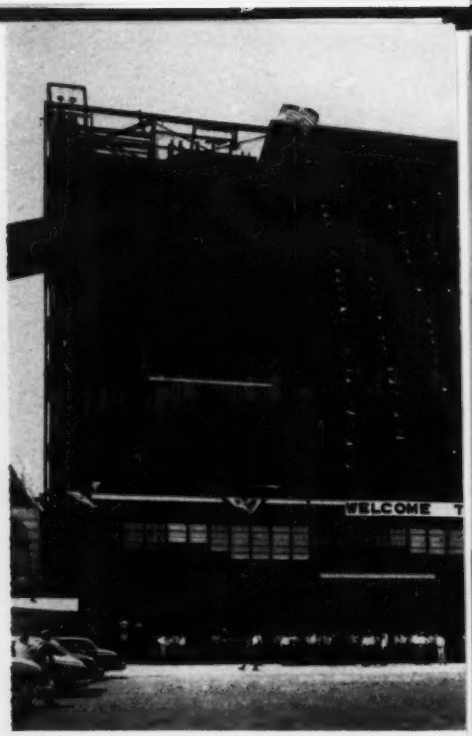
Southern Portion . . . The southern arm of the project will control the Litani below Karaoun Dam. Water will be diverted into the Kelia Tunnel, 10.1 miles long, to develop a 1,120 ft head into a 16,000 kw plant. It then will pass into the Khardale reservoir, to be formed by a rockfill dam 215 ft high. Water will be diverted into the Zrayiye canal and tunnel to an 840 ft drop into a 10,000 kw plant.

Robert F. Herdman, project engineer, estimates the cost of the project at $70 million. Upon completion of the investigation, Lebanon will decide how much of the project it wishes to undertake. Plans are to seek World Bank financing.

Plenty of construction difficulties are foreseen. The Bisri Dam will have to be built on 387 ft of silt. The tunnel will be bored 3,000 ft from the top of a fractured and cavernous limestone mountain filled with water. Karaoun Dam will be founded on porous limestone.

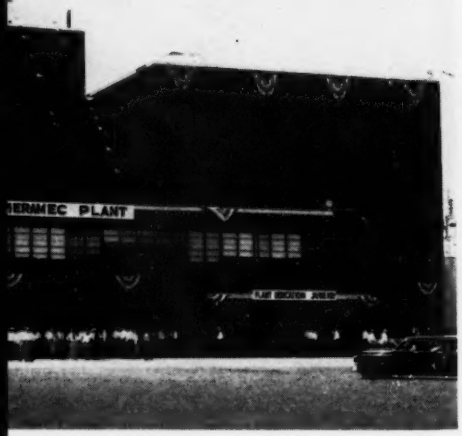


PENNANT RAISING at dedication ceremony officially adds Meramec to Union Electric's string of plants. Pres J. W. McAfee hoists the pennant as the crowd of 400 looks on. Plant was first steam station built in Missouri in last 50 years



The Meramec Plant

McAFEE, right, shows central control room to Roscoe Hobbs, president of the St. Louis Chamber of Commerce



Meramec in Missouri: First in Half a Century

Union Electric's Meramec Plant, dedicated June 10th, is the first steam generating station to be built in Missouri since 1903.

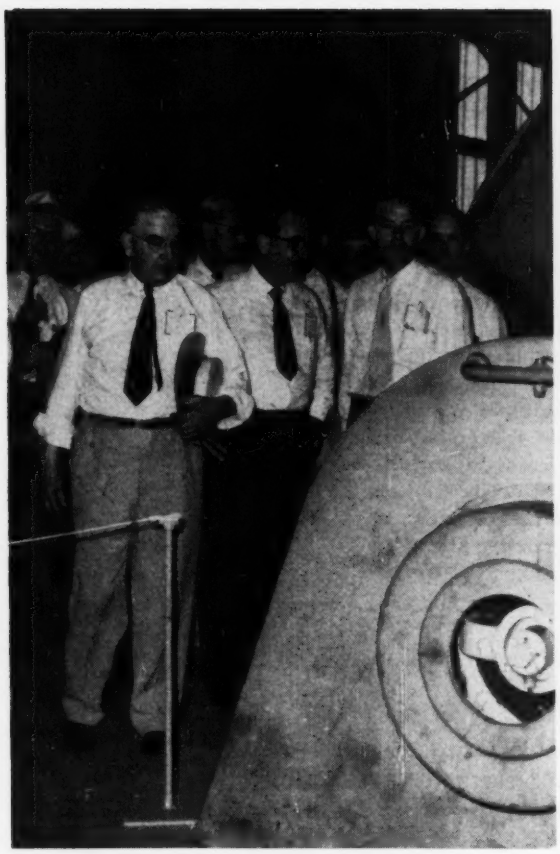
First unit, placed in service May 21st, has a nameplate rating of 110,000 kw and maximum capability of 140,000 kw. The turbine is a 3,600 rpm, three cylinder, tandem compound type, operating at 1,250 psi, 950 F.

The single boiler for the first unit is a pulverized coal-fired, reheat type with a completely water-cooled furnace. Rated maximum continuous steam generating capacity is 925,000 lb per hr delivered at the superheater outlet at 1,400 psi and 900 F.

Meramec is a semi-outdoor plant, built for maximum economy in both original investment and operating costs. Building walls are of insulated metal panels. Cost of the first unit, of 140,000-kw maximum capability, is $26 million. Cost of the first two units is estimated at $47 million.

When the second unit goes in service in the spring of 1954 it will bring system capacity above 1,500,000 kw.

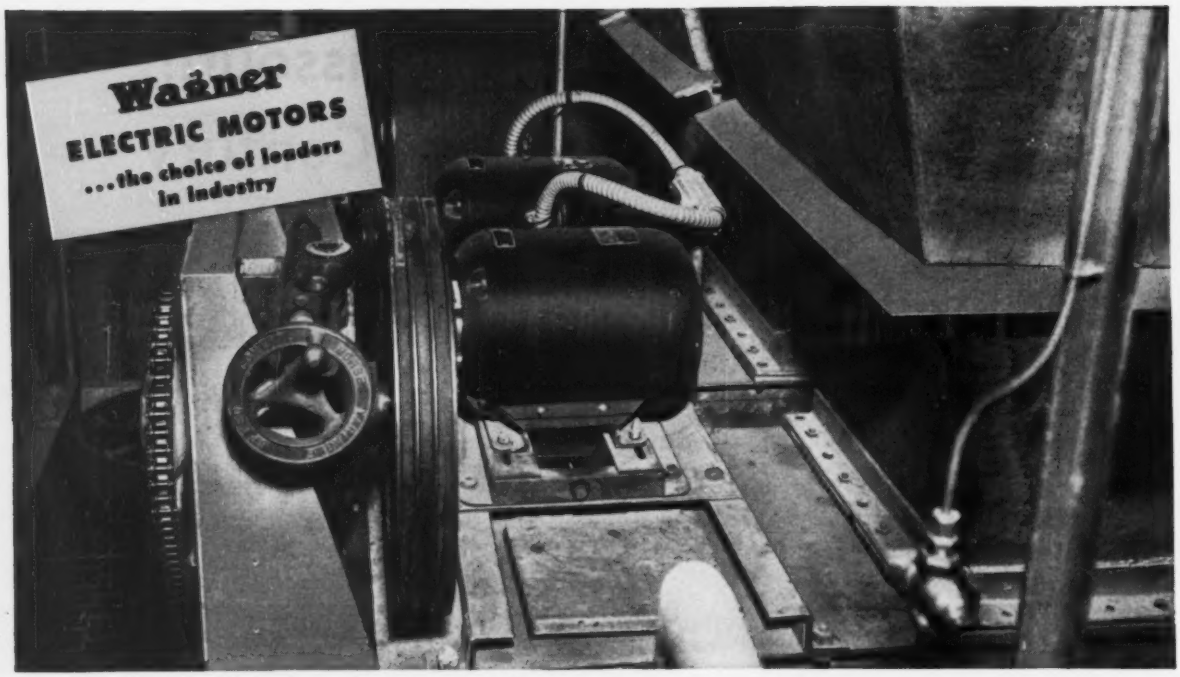
Pres Gwilym A. Price, Westinghouse Electric Corp, was the chief speaker (EW, June 22, p 7) at the Meramec dedication ceremony, pictured here.

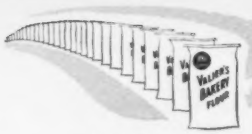


TURBOGENERATOR, of 110,000 kw nameplate capacity, caught visitors' eyes as they streamed through the plant after the outdoor ceremony. Second unit will go on line next spring

VISITORS, even the women, were fascinated by plant's nerve center. Here are located boiler, turbine and generator panels and controls. Plant engineers explained their operation

NEWS ABOUT PEOPLE





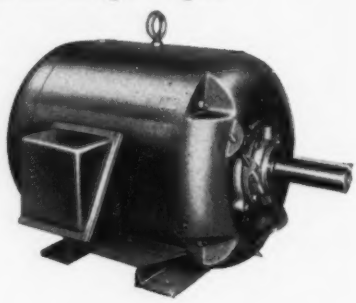
How to operate on 8 hours a day...

Valier and Spies Milling Co., Division of Flour Mills of America, Inc., has just constructed a new "daylight" bulk flour storage, packing, and automatic loading facility, designed to speed operations to the extent that it can turn out as much packaged flour in 8 hours as was formerly packed in 24.

An operation of this kind requires the use of electric motors—motors to help carry the flour 120 feet to the top of the plant—motors to power the sifters and mixers—motors to drive the conveyors—motors for reclaiming operations. A total of 125 Wagner totally-enclosed fan-cooled (Type CP) motors, in ratings from 2 to 75 hp, are used in this new plant.

Wagner Type CP Motors were a logical choice for this application, since they are designed to operate efficiently in atmospheres filled with dust. They are used in industry everywhere because they are fully protected against damage from dirt, fumes, moisture, abrasives, steel chips, and other harmful elements. Even under the most adverse conditions, Wagner Type CP Motors keep on working, delivering dependable power with no maintenance other than periodic lubrication.

For your requirements there is a Wagner Motor to fit every need—a complete line for all current specifications, with a wide variety of enclosure types and mountings. Wagner engineers are qualified to specify the correct motor for your needs. Consult the nearest of our 32 branch offices, or write us.



Wagner Electric Corporation
EST. 1891

WAGNER ELECTRIC CORPORATION
6456 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE
BRAKE SYSTEMS—
AIR AND HYDRAULIC

WMS9-9

NEWS ABOUT PEOPLE

Cook Made Vice President . . .

. . . of American Gas & Electric Service. Former SEC chairman also is named assistant to President Sporn

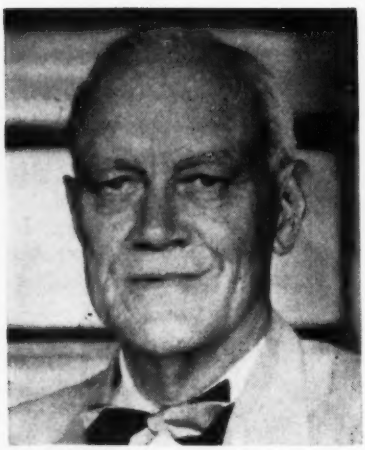
DONALD C. COOK

American Gas & Electric Service Corp has appointed Donald C. Cook, ex-chairman of the Securities and Exchange Commission, vice president and assistant to Pres Philip Sporn.

Cook served on the SEC staff for ten years, 1935-1945, the last seven as a member of the Public Utilities Division. After leaving the commission in 1945, he filled various government posts and engaged in private law practice. In 1949 he was named a member of SEC, becoming its vice chairman in 1950 and in 1952 was made chairman.

During 1950-1952, Cook also served as chief counsel to the Senate Armed Services Preparedness Committee.

Heads International Power



FREDERICK KRUG

The new president of International Power Co, Ltd, Montreal, Can., is Frederick Krug. He succeeds I. W. Killam, who has relinquished the presidency after serving in that post since the company's incorporation in 1926. Killam, however, will continue to serve on the board of directors.

Krug, an electrical engineer, was vice president of International Power until the present promotion. In addition, he has served as general manager of the Montreal Engineering Co, Ltd, since 1940.

Born in New York City, Krug was educated at Cooper Union, New York. He also attended New Mexico Institute of Mining & Technology and Massachusetts Institute of Technology.

He is a fellow of the American Institute of Electrical Engineers and a member of the American Society of Mechanical Engineers.

•

Rufus P. Thomas, industrial engineer of Kentucky & West Virginia Power Co since 1949, has been appointed to the new position of industrial-development representative for the utility.

Ira W. Collins, general superintendent of power control of Pacific Gas & Electric Co, has been named assistant to George H. Hagar, newly appointed vice president in charge of operations (EW, June 8, p 30). Collins' successor is **Jack H. Martin,** assistant engineer in the department of electric operation. **Robert H. Miller,** now general superintendent of communications, was made assistant general superintendent of power control. **Robert L. Brinton,** who has served in the communications branch of PG&E's operating department, succeeds Miller.

Henry Jacobs, sales co-ordinator of Pennsylvania Power & Light Co since 1950, has been named the company's assistant general sales manager.

Frank W. Wehrheim, since January, 1952, sales manager of the Electrical Fittings Division of Appleton Electric Co, Chicago, has been appointed general sales manager of the firm.

JOHN H. DYETT

Rome Cable Corp Names John Dyett Executive VP

John H. Dyett has been named to the newly created position of executive vice president of Rome (N. Y.) Cable Corp. At the same time, Gerard A. Weiss was named secretary succeeding Dyett.

Dyett, who has been a director of Rome Cable since 1936, has served as vice president, secretary and assistant treasurer. With Rome Cable for the past three years, Weiss has headed the firm's legal department. He also served as assistant secretary of the company.

Iowa PS Officials Elevated

E. M. Raun becomes vice president and general manager and Merl Parr assumes post of vice presidency

E. M. RAUN

E. M. Raun, vice president and manager of the Sioux City Division of Iowa Public Service Co, has been elevated to vice president and general manager of the company. Merl Parr, manager of the utility's East Division, has been advanced to vice president.

Raun, a graduate electrical engineer of Columbia University, began his career with Iowa Public Service while still a student. Following graduation in 1926, he joined Iowa PS as a full-time engineer. After serving in various electric and gas production, and distribution posts, he was made assistant general manager of the Sioux City Division in 1946. Three years later he was promoted to manager of the division, becoming a vice president in 1950.

MERL PARR

Parr became associated with Iowa Public Service's East Division in 1926. He was made the division's electrical engineer, then division manager. He will continue in the manager's post with headquarters at Waterloo.

Heads Curtis Lighting

Darwin Curtis, formerly chairman of the board of Curtis Lighting, Inc, has been elected president and treasurer of the firm to succeed the late Melvin C. Wilt (EW, June 29, p 150). The firm also announced the appointment of Ward Harrison, president of the International Commission on Illumination and former director of engineering for General Electric Co's Lamp Division, as its new board chairman. George Gilleard, assistant chief engineer, was named secretary.

OBITUARY

Ben H. Hughes

Ben H. Hughes, 55, president and general manager of Hughes Brothers, Inc, Seward, Neb., died there June 23.

Hughes, a co-founder of the Hughes organization in 1921, was well known for his pioneering work on wood structures for transmission and distribution construction. He was active on many committees of Edison Electric Institute and American Society of Testing Materials.

Davis H. Tuck

Davis H. Tuck, 64, consulting engineer and former chief electrical engineer for Holophane Co, Inc, New York, died July 5 at Redding Ridge, Conn.

Tuck was chief electrical engineer of Holophane from 1918 until 1951 when he became consulting engineer for the firm.

After graduating from the Massachusetts Institute of Technology in 1911 with a BS degree in electrical engineering, Tuck worked in the National Bureau of Standards' Photometric Laboratory, where he originated the multivoltage technique of standardizing Tungsten filament lamps against the carbon lamp standards.

J. E. North

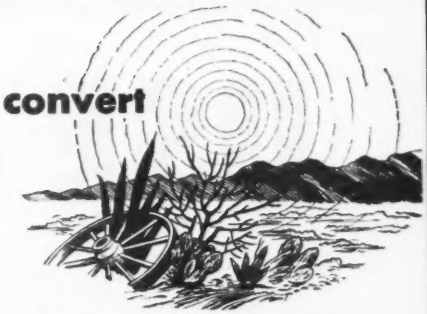
J. E. North, 69, who retired as general sales manager of Cleveland Electric Illuminating Co in 1949, died July 1. North joined CEI in 1919, becoming director of residential sales in 1934 and general sales manager in 1943. He became president of the Electrical League of Cleveland in 1923 and served continuously in that post until 1949.

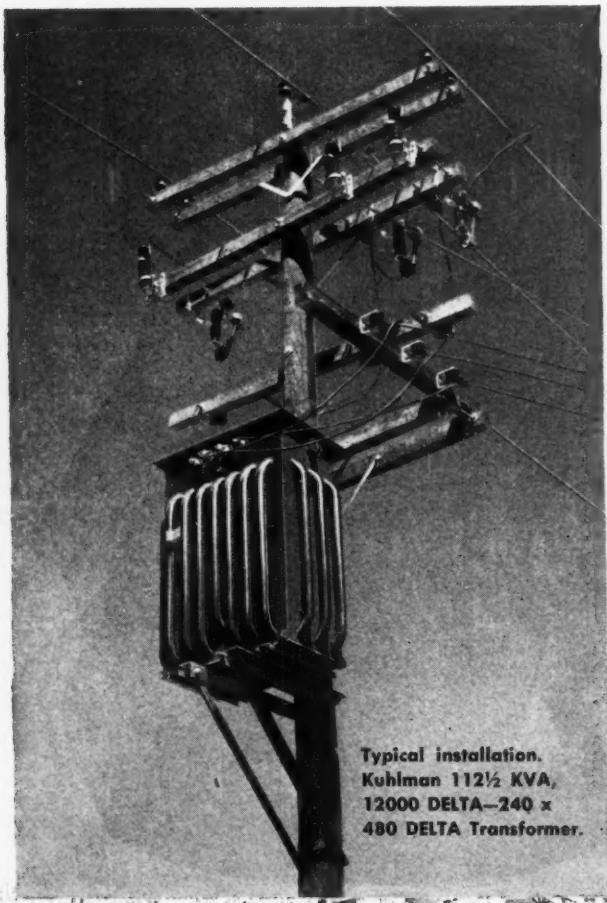
Charles B. Morin, 54, manager of Ohio Power Co's commercial and industrial department since 1941, died June 29. With Ohio Power since 1923, he directed the sales of power to commercial and industrial customers and directed the company's industrial development program.

Edgar P. Brantley, 58, senior engineer in charge of transmission design and high voltage distribution lines for Georgia Power Co, died June 20. Brantley, an electrical engineering graduate of Georgia Institute of Technology, joined the utility in 1923.

Harry A. Pastre, 80, who retired as vice president of Elliott Co, Jeannette, Pa., in 1943, died recently. Associated with W. S. Elliott before the latter founded the firm in 1901, Pastre became a vice president in 1935.

74 KUHLMAN TRANSFORMERS help convert arid desert into fertile farmland





Typical installation. Kuhlman 112½ KVA, 12000 DELTA—240 x 480 DELTA Transformer.

A few years ago, the land surrounding Pecos, Texas, was a vast tract of sandy desert where mesquite, cactus and catclaw were the principal vegetation. Today, this same land produces a bountiful harvest of cotton, cantaloupe, alfalfa, grain sorghum and many other crops. For electricity, providing the energy to pump water from irrigation wells, has made it possible to reclaim thousands of acres of the parched range land. Seventy-four Kuhlman three-phase Transformers helped accomplish this miracle.

Kuhlman Transformers have been serving agriculture and industry with dependable equipment for more than 60 years. Kuhlman Transformers include power, distribution, dry type, Saf-T-Kuhl, subway, rural, series and C.S.P.

The new modern plant of Kuhlman Electric Company at Crystal Springs, Mississippi is ready to supply the needs of utilities and industries throughout the South. Write today for complete information.

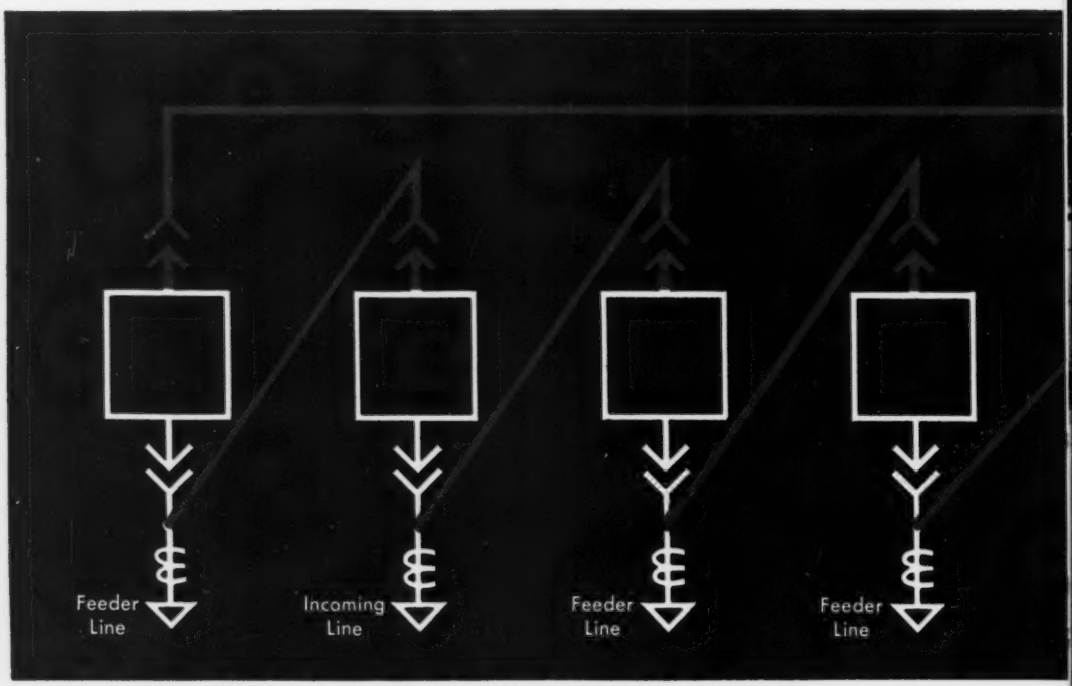
139

Kuhlman ELECTRIC COMPANY

BAY CITY, MICHIGAN • CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: *International Standard Electric Corporation,*
15th Floor, 50 Church Street, New York 7, New York. CABLE ADDRESS: Microphone, New York

USE A FLEXIBLE *Without the*



No costly extra cubicles needed! Ring buses are built into standard units of Allis-Chalmers Metal-Clad Switchgear. This economy, together with their other advantages, makes ring bus schemes more attractive than ever.

Important Advantages

First, there's the flexibility of a ring bus as shown in the single line diagram above. For example, one breaker functions as both a feeder breaker and a bus tie breaker, and it is possible to feed each circuit from either of two breakers. In addition, a ring bus provides continuous service while a circuit breaker is taken out for routine maintenance.

While these advantages can be enjoyed with other circuit arrangements, additional equipment is usually required and it becomes too expensive. As a result, ring bus schemes are often overlooked. But with Allis-Chalmers switchgear a ring bus scheme is simple. The only change from standard construction is the diagonal bus from the front of one unit to the rear of the adjacent unit.

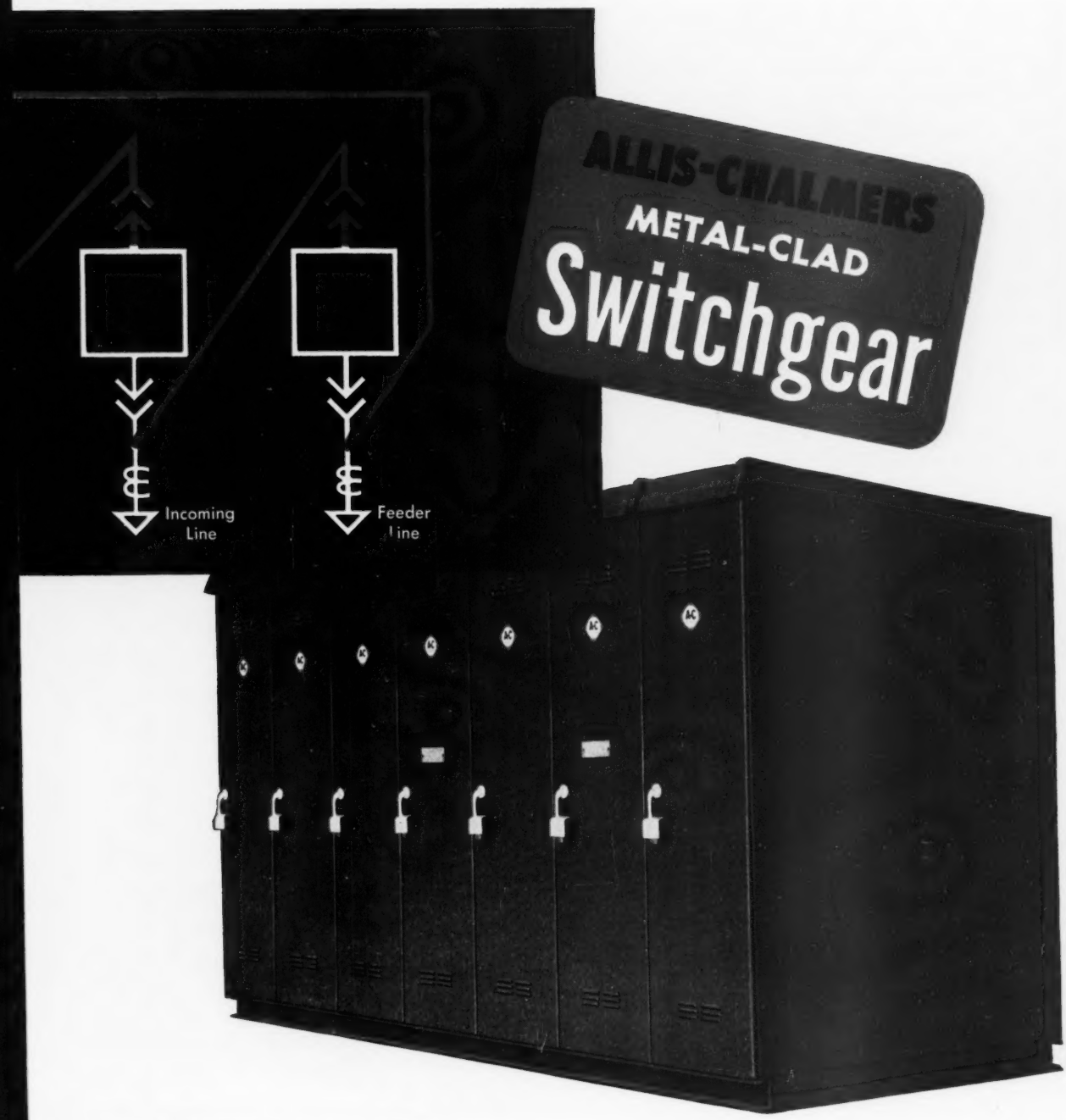
It's time you enjoy the flexibility of a ring bus with Allis-Chalmers switchgear — without the usual high cost.

Talk it over with an A-C engineer. Call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wis.

A-3991

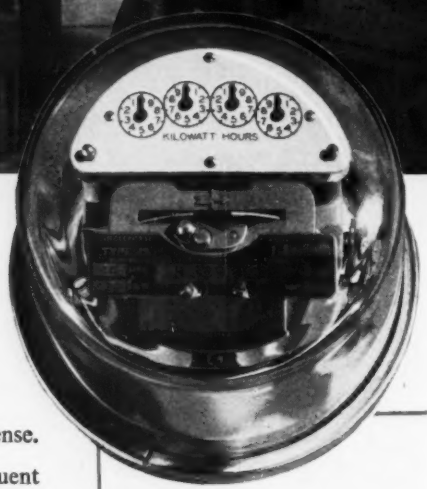
ALLIS-CHALMERS

RING BUS
Usual High Cost!



a full measure of operating economy

Sangamo J Meters



Many Utilities have installed modern meter test and shop facilities because Meter Department Executives are well aware of the many economies made possible by such labor saving equipment.

But . . . the *full* measure of operating economy is obtained only when such facilities are coupled with a meter *designed* for minimum maintenance expense.

The Sangamo Type J Meter: Stays accurate—frequent recalibration is unnecessary. . . Doesn't deteriorate in corrosive atmospheres . . . Remains undamaged under extreme surge or overload conditions—high current carrying capacity reduces burnouts on heavy overloads.

Keep *your* operating expenses at a minimum with the proven Sangamo J Meter.

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

Only Measured Facts are Known Facts

JM53-5

KUB Salutes Its Older Employees

Knoxville, Tenn., Utilities Board is using window displays shown above to salute its employees who have devoted 25 years or more of their lives in providing the public with modern utility services.

Drive to Ease Engineer Shortage Shows Results

Recent intense campaigns to reduce the nation's critical shortage of engineers "are starting to pay off," Louis M. Stark, manager of the Westinghouse school service department in Pittsburgh, said recently.

He declared that while the engineer supply picture is far from bright, it was "heartening to note a 29% increase in the number of college and university freshmen who enrolled in engineering courses in 1952."

Emphasizing that there will continue to be a great need for more and more engineers, the Westinghouse executive said the most recent encouraging fact is that while enrollment on the whole moved up 11%.

"In 1951, some 40,000 freshmen enrolled in engineering and this group will produce about 22,000 graduates in 1955," he pointed out. "In 1952 the enrollment of first year engineering students rose to about 52,000, justifying an estimate of 29,000 graduates in 1956. This is still not sufficient to meet the country's basic needs, but it shows a rapid improvement."

The increase in the number of engineering freshmen last year, he pointed out, is proof that the efforts of engineering societies, industries, universities, and high school science teachers have had a marked effect in steering young people into careers in technical fields.

Tacoma City Light Tops, Labor Leader States

"Tacoma City Light has the best labor relations of any utility—public or private—in the United States," Randy Green, business agent of local 483 International Brotherhood of Electrical Workers, AFL, said at a recent public meeting in Tacoma, Wash.

Green said he does not feel that public power is a "sacred cow," declaring that "good private power far excels bad public power" and indicating there was a substantial quantity of both.

One of the "tragedies of public ownership is that the minute the public owns something, the citizens feel they are authorities on the subject," Green said.

Spokane Union Backs WWP-Puget Merger

Local 77 of the International Brotherhood of Electrical Workers, AFL, at Spokane, Wash., which represents employees of the Washington Water Power Co, has adopted a resolution favoring merger of that company with the Puget Sound Power & Light Co of Seattle.

The same resolution puts the union on record as opposing PUD purchase of Puget Power & Light because, the union said, the PUDs have given no assurance they will recognize the union if they acquire all private power companies in the state.

LABOR BRIEFS

Boston Edison Co signs agreement with Local 386, CIO professional workers union, covering 117 members, for a 12½ cents per hour wage increase, retroactive to Jan. 1, 1953. Discussions may be reopened, if desired, after April 1, 1954 . . . **A 5% pay increase** for the 10,103 employees of the Department of Water & Power, Los Angeles, totaling $2,315,172 annually, has been granted by the Water and Power Commission. The boost includes top executives. General Manager S. B. Morris says hike follows pattern set by other California utilities.

READY TO START moving the 750-kva General Electric network transformer, with submersible protector, from trailer to vault. Notice the room air-conditioning units in the windows—one of the reasons why more capacity is needed here.

SALES & SERVICE RESIDENTIAL • RURAL • COMMERCIAL

Potomac Electric, Washington, D.C., installs G-E network unit to meet extra-heavy load demands

System reinforced with 750-kva G-E transformer and network protector

The flexibility and ease of expansion provided by a secondary network system certainly "pays off" for Potomac Electric Power Company in downtown Washington, D. C. Flexibility of the system permits load growth additions with minimum interference to service in the highly concentrated downtown area.

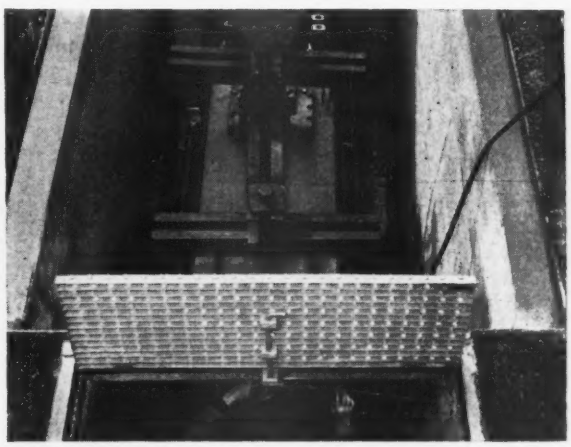
The financial district is experiencing a phenomenal growth and the consequent heavier load requirements, including air-conditioning in existing buildings in the area, necessitated installation of this 750-kva G-E network transformer. The unit, equipped with a submersible automatic network protector, is located at 730—15th Street, N. W., directly in front of the American Security and Trust Company building.

Compactness of G-E network units permits minimum vault depth (7 feet to roof slab) for lower installation cost.

It pays to start a network. Although the change from a radial to a network system means substantial initial expense, future increases in capacity require less investment with a network system. With a growing load, the sooner the network system is started, the lower the ultimate cost. Why not investigate the advantages for your system?

For help in solving your network problems, and for complete information on the many advantages of G-E standardized network units, get in touch with your nearest G-E Apparatus Sales Office, or write for Bulletin GEA-5024, General Electric Company, Section 431-201, Schenectady 5, N. Y.

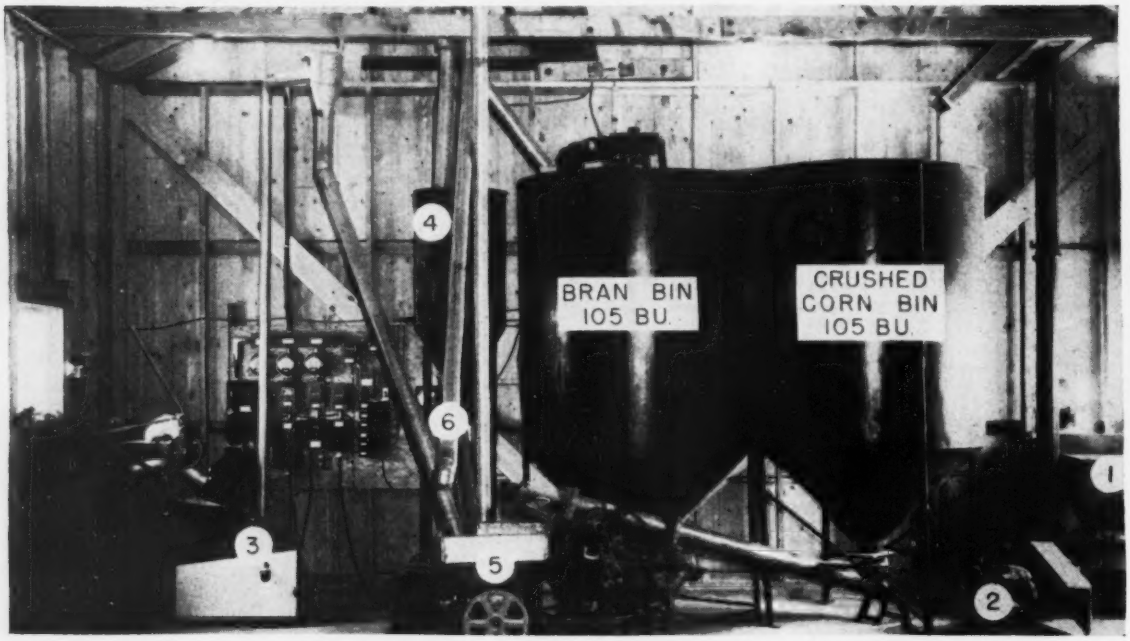
ALMOST IN PLACE and with minimum inconvenience, even in a congested downtown area. Note the G-E submersible automatic network protector on the low-voltage end of the transformer.



CENTERING UNIT in vault prior to cabling. Convenient location of cable terminals on G-E units makes minimum size vaults practical—simplifies connections for fast installation.

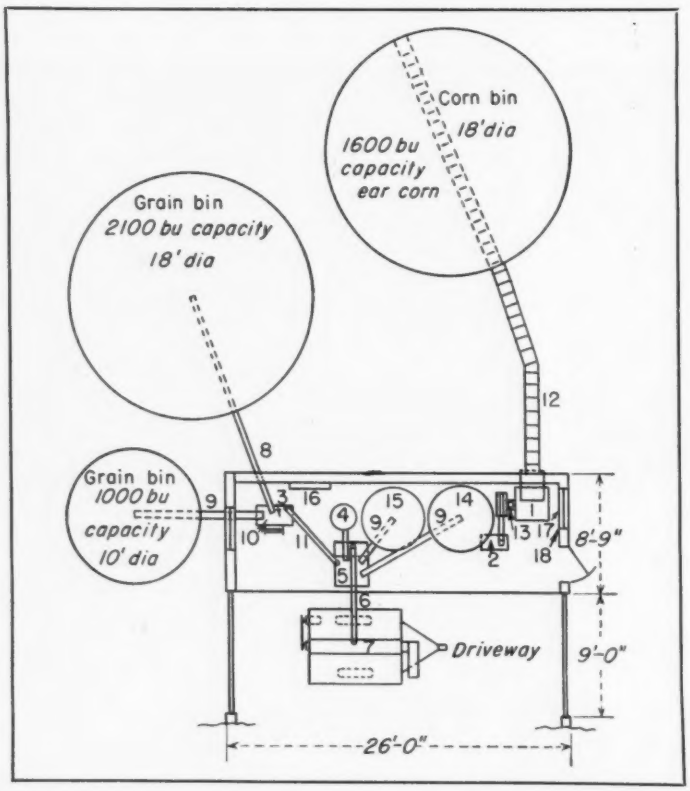
You can put your confidence in—

GENERAL ELECTRIC



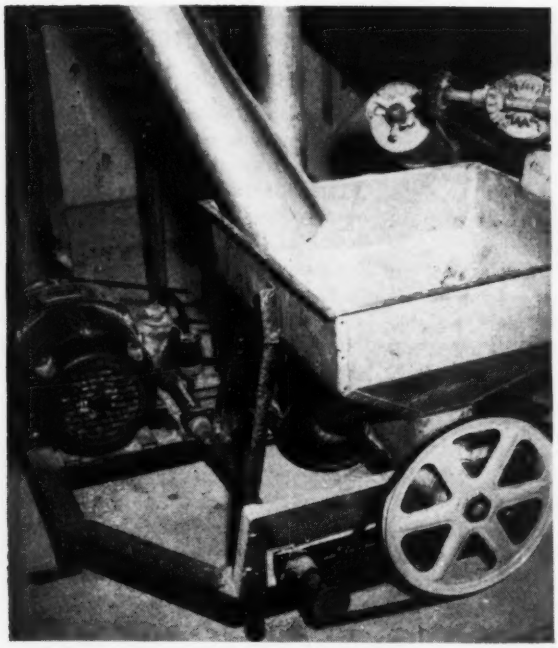
EQUIPMENT, identified below, that is heart of system used by Wisconsin research farm for . . .

Processing Grain With Push Buttons



Here's the equipment In the feed plant

1. Corn crusher
2. 7½-hp motor
3. Hammer mill
4. Concentrate hopper
5. Blower and 2-hp motor
6. Mixed feed delivery
7. Portable feed bin
8. 3-in. auger
9. 5-in. augers
10. 2-hp motor
11. Ground oats delivery
12. Corn elevator
13. Crushed corn elevator
14. Crushed corn hopper
15. Bran hopper
16. Switch panel
17. Corn elevator switch
18. 7½-hp motor starting switch



CLOSEUP of blower unit where ingredients are mixed

Electric-fed equipment saves time and costs of feeding, tests at research farm show

L. A. BROOKS, Project Leader, Electric Research Farm, University of Wisconsin, Madison

Automatic feed grinding, processing, and handling, the dream of every dairy farmer, has been realized on the Wisconsin Electric Research Farm, a typical dairy farm where electrical applications are being studied.

With the feed plant which has been developed under the auspices of the University of Wisconsin, through financing provided by the Wisconsin Utilities Association:

- There is no hand handling of the home grown feeds from harvest to feeding.
- Grinding and mixing are done merely by pushing the switches to start and stop the equipment.
- Entire unit is designed for prefabrication so it can be manufactured and sold as a complete unit.
- All storage units for grain and corn are prefabricated round metal bins.
- Operating costs show a substantial saving by comparison with custom grinding.

General Outline . . . Grinding and mixing equipment is installed at one end of the machine shed, with the storage bins for small grains and ear corn located outside.

The two small grain bins are on concrete block foundations which are inexpensive and easy to build. A metal sheet lying atop a sand fill provides a good floor. The bin, which has a capacity of 1,600 bu of ear corn, is on a concrete foundation about 2½ ft high and equipped with a slatted floor for artificial drying.

A conveyor running through the bottom of the bin elevates the corn directly into a burr type of grinding mill. The discharge end of the elevator is suspended so that it can be turned to the side for loading corn into a truck or wagon. The elevator is operated with ½-hp motor and delivers corn to the grinder at its full capacity.

Ground corn is stored in a hopper of 105 bu capacity so that it is necessary to grind it only about once every month.

The grinder, which has a capacity of about 2½ tons per hour, is operated by a 7½-hp motor that is also used to operate the mow hay drier fan at hay making time.

All augers from hoppers and grain storage gins are equipped with variable speed drives which are easily adjusted for changing the ration. Augers have been calibrated to determine the amount of the various feeds delivered with each setting. These drives are each operated with a ¼-hp motor.

As the various ingredients of the ration are blown through the feed delivery pipe they become completely mixed. The mixed ration is then delivered into a V-bottomed portable bin which is equipped with a self-unloading auger.

Feed is delivered to a small feed cart as needed for feeding by the unloading auger which is operated by a 1½-hp motor. The portable bin has sufficient capacity so that it is necessary to grind feed about every 10 days for a herd of 24 milk cows.

Grain grinding and ration mixing are done at the rate of 1,000 lb per hour. Equipment is automatic, requiring attention only for starting and stopping.

Cost Small . . . Total cost of the grinding and mixing equipment is about $2,300.

During a six-month test period in which 16 tons of feed were handled, operating costs were 1.2 cents per 100 lb based on a cost of 2½ per kwhr. This includes conveying the corn and oats from the storage bins, elevating the bran and concentrates into their hoppers, grinding the grain, mixing everything to form a balanced ration, and delivering it into the portable bin.

This amounts to a saving of about 10 cents per 100 lb compared to custom grinding—not even considering the saving in labor, which is probably the most important factor. The hard work normally required for handling the feeds has been eliminated. The only time the feed is handled by hand comes when it is fed to each individual cow.

These motors keep feed processor running

Hp.	Equipment	Amperes	Volts
7½	Corn crusher	35.7	230
¾	Corn conveyor	5.0	230
2	Hammer mill	11.5	230
2	Feed blower	9.4	230
¼	Oats auger	5.0	115
¼	Oats auger	4.6	115
¼	Bran auger	4.8	115
¼	Crushed corn auger	5.3	115
1/6	Concentrate hopper	2.6	115
1/6	Bran and crushed corn agitator	2.5	115
13-7/12		**86.4**	

FINANCIAL

WWP-Puget Hearings Reopen

L. E. Karrer, Puget Sound executive, tells Washington PSC his company is ready to spend $30 million for expansion

L. E. Karrer, executive vice president of the Puget Sound Power & Light Co, was the principal witness as the Washington State Public Service Commission re-opened a public hearing at Seattle on proposed merger of that company with the Washington Water Power Co.

After a week in Seattle, the hearing was moved to Olympia, where it is expected to continue until about July 24. This phase of the hearing is being devoted to testimony against the merger, just as the first phase was devoted to testimony favoring the merger.

$30-Million Construction Program . . . Karrer revealed his firm is ready to launch a $30-million expansion program if it remains an independent organization, a condition contingent not only upon abandoning the merger but also upon an end to PUD condemnation suits against company properties.

The program would include installations of a 55,000-kw unit at its White River hydroelectric plant, costing $9 million; another unit of the same size at the Baker River hydro plant, costing $7 million, and a 100,000-kw unit at the Shuffleton steam plant, costing $13 million. Later, a storage dam might be built on the upper Baker River and the Snoqualmie hydro plant enlarged.

These additions would be necessary to meet a power deficit which the company expects at peak periods in the future, Karrer said.

The proposed new Bonneville Power Administration contract is not acceptable to his firm, in that it does not allow a private utility to use its resources to the best of its ability, Karrer declared. He felt that BPA will be forced to alter its contract. Otherwise, Karrer thought, the effect of the contract might wreck the Northwest Power Pool. The proposed contract would charge the private power companies for the largest amount of power they would use in a 12-month period even though the power might be required for only a short period, said Karrer.

Harvey Davis, attorney for the Chelan County PUD, attempted to have Karrer compare the favorable position of Puget with that of WWP on the matter of power supply. Karrer said he could go no further than the water year 1953-54, when Puget will have a surplus and WWP a deficiency.

Rates Compared . . . Efforts to compare the companies' rates also failed. Opponents of the merger said they will show that WWP rates are higher and that, under a merger, Puget's rates would be boosted to conform. Proponents of the merger say that a power rate decrease is quite possible instead.

Karrer testified that PUD condemnation suits pending against Puget were a prime reason for the company's interest in a merger. Past sales of Puget property to other utilities have been of benefit to stockholders but continued piecemeal sales would not work to the advantage of the utility, he said.

Carl Gieseker, treasurer of the WWP, was questioned by Frank Hayes, assistant state attorney-general, over a recent change in accounting methods which gave the company an additional $211,000 in net income.

Washington PUDs Set Sales, Customer Records

The 22 Public Utility Districts in the state of Washington last year sold $24,728,575 worth of electricity to 197,607 customers, 23% of the state's light users, according to a report by R. W. Beck & Associates, engineering and financial advisors for several of the districts. Both figures are new records.

The PUDs paid $1,418,450 in taxes, exclusive of sales taxes and have total remaining debts of $67,717,324. Average PUD has paid off 20% of its debt, the report says.

Higher Valuations Ordered For Colorado Utilities

Substantial increases in the valuations for tax purposes of Colorado utilities have been ordered by the Colorado Tax Commission as the result of revisions made in tax assessments at the suggestion of the state legislature.

The total valuation of utilities in the state was boosted $24,973,450 above the 1952 valuation of $293,057,300. The new valuation is $318,030,750.

Most of the increase was ordered in the valuation of gas, electric, and telephone utilities. Railroad properties were boosted only $67,120.

Public Service Co of Colorado, the state's largest single taxpayer, was handed the biggest single increase. Public Service valuations were boosted $9,847,040. Its total valuation now is $69,596,440 compared with $59,749,400 in 1952.

Chairman John Seaman of the tax commission said the increases for the electric, gas, and telephone utilities resulted largely from plant expansions. A study of utility assessments was ordered by the 1953 legislature. The increases, Seaman said, follow recommendations of Clem W. Collins, Denver accountant and tax expert. His employment by the commission was authorized by the legislature.

Total valuation for electric companies as a class is $89,201,020 compared with $77,191,650 last year. Individual valuations included Southern Colorado Power Co increased from $7,068,810 to $8,332,720 and the Colorado Central Power Co increased from $2,512,730 to $3,313,440. Rural electric companies were boosted from $7,754,740 to $10,217,560.

All of the valuations are subject to protests. Utilities were being heard as EW was going to press.

FINANCIAL BRIEFS

Niagara Mohawk Power Corp has absorbed the Corinth Electric Light & Power Co and Corinth's customers will get a rate reduction averaging 13% . . . **Central Vermont Public Service Corp** has taken over the Pub-

lic Electric Light Co. Pres A. A. Cree of CVPS said no rate change in Pelco area will take place . . . **Philadelphia Electric Co** employees have subscribed for 105,148 shares of common stock under an employee stock purchase plan which ended July 1. This oversubscription made it necessary for the company to file a registration statement with the Securities and Exchange Commission seeking registration of an additional 5,148 shares of its stock. The offering of the original 100,000 shares previously registered was oversubscribed. Subscriptions were received from 2,902 employees and annuitants, exceeding by 589 the number who participated in the last stock offering four years ago.

Ohio Power Co has asked SEC approval to acquire the generating and distribution facilities of the village of Arlington, Ohio, for $141,760 . . . **Northern States Power Co** has received SEC approval to purchase from Minneapolis Street Railway Co and St. Paul City Railway Co a 35-cycle steam plant, two substation buildings, 23 miles of underground conduit lines and three tunnels for underground cable purposes. Base purchase price for this property is $1.5 million.

REGULATION

A 10% cut in commercial and industrial rates has been approved by the Ellensburg, Wash., City Council for its municipal lighting system. The new rates will be lower than any other city in the state except Tacoma . . . **Rep Nolan F. Ziegler and Rep Robert S. Ogilvie,** both Republicans, have introduced a bill in the Pennsylvania legislature for a 5% consumers utility tax designed to raise $60 million annually on electric, gas, telephone, telegraph, water, transportation, pipeline and sewage disposal services.

A report "Limiting Factors in Tariff-Structure" by Dr Ing. B. Wehberg which was read at the 1949 manual meeting of the Cologne University Institute for the Economics of Power Supply has now been made available. It develops in theory and practice another method for the calculation of power rates with special regard to industrial customers. A copy can be obtained by writing Director Dr Ing. B. Wehberg, Niedersachsische Kraftwerke A. G. (Nike), (23) Osnabruck, Schlagvorderstr. 15, Germany.

Illinois Commerce Commission has suspended until Nov. 22 the $19.4 million a year rate increase asked by Commonwealth Edison Co. First meeting is scheduled to be held in September . . . **Maryland Public Service Commission** has turned down a request by Consolidated Gas, Electric Light & Power Co of Baltimore to rescind the PSC's order granting a six-month continuance of hearings on the proposed rate increases for electricity and steam. The company had charged the PSC with "an unreasonable exercise of administrative authority" for granting the continuance in order that an audit of the company's books could be made.

Today in Utility Finance

YIELDS (%)

Quality	Bonds			Preferred Stocks			Common Stocks		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
DATE									
1953									
July 9	**3.30**	**3.35**	**3.57**	**4.34**	**4.56**	**4.82**	**5.39**	**5.73**	**6.01**
July 2	3.32	3.40	3.61	4.39	4.63	4.85	5.46	5.85	6.06
END OF QTR.									
2nd 1953	3.34	3.46	3.64	4.47	4.70	4.88	5.52	5.93	6.10
1st 1953	3.15	3.23	3.39	4.16	4.41	4.66	4.95	5.24	5.50
4th 1952	2.99	3.03	3.14	4.06	4.22	4.59	4.98	5.33	5.62
3rd 1952	2.99	3.03	3.16	4.10	4.26	4.61	5.18	5.59	5.96

Data: Reis & Chandler, Inc.

EARNINGS

Company	Period Months Ended		Net Income 1953	Net Income 1952	Earnings Per Common Share 1953	Earnings Per Common Share 1952
El Paso Electric	12	May	$ 1,595,279	$ 1,491,592	$2.00	$1.86
Houston Lighting & Power	12	May	9,523,507	7,634,236	....	....
Iowa Electric Light & Power	12	May	2,752,471	2,301,989	1.82	1.48
Pacific Power & Light	12	May	4,532,576	3,959,992	....	....
South Carolina Electric & Gas	12	May	2,908,932	1,968,668	0.86(a)	0.61(a)
Washington Water Power	12	May	5,242,453	3,842,275	2.15(b)	1.43(b)
West Penn Electric, consolidated	12	May	13,337,780	11,765,098	3.15(c)	2.97(c)
			1952	**1951**	**1952**	**1951**
Chicopee Electric Light Department	12	Dec.	51,431	68,633	....	....
Medford (Wis.) Electric Utility	12	Dec.	36,568	.....	....	....
Toronto Hydro Electric System	12	Dec.	14,141	.....	....	....

Notes—(a) Based on 2,864,359 shares in 1953 and 2,506,314 shares in 1952; (b) Based on 2,342,411 shares in 1953 and 2,541,800 shares in 1952; and (c) Based on 4,224,000 shares in 1953 and 3,960,000 shares in 1952.

FINANCING

Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF JULY 9-15			
Bonds			
Nova Scotia Light & Power—1st mtg 4¼% due 1974	$2,100(f)	100.00%	4.875%
Consumers Power—1st mtg 3¾% due 1983	25,000(b)	101.25	3.681
SCHEDULE FOR JULY—AUGUST—SEPTEMBER			
Bonds			**Bid Date**
Western Light & Telephone—1st mtg due 1983	$3,000(c)	.....	July 21
Duke Power—1st and refunding mtg	35,000	.....	Sept. 1
Louisiana Power & Light—1st mtg due 1983	12,000	.....	Sept. 15
Metropolitan Edison—1st mtg due 1983	8,000	.....	.....
Southern California Edison—1st mtg	30,000	.....	.....
Debentures			
Central Hudson Gas & Electric—conv debs	$6,000	.....	.....
Common Stock			
Boston Edison—246,866 sh (to be offered commonholders on 1-for-10 basis record July 16 to expire Aug. 3 with an over subscription privilege)	.....	.....	.....
Central Hudson Gas & Electric—140,000 sh (to be offered commonholders on 1-for-15 basis)	.....	.....	.....
Nova Scotia Light & Power—53,260 sh	.....	.....	.....
Duke Power—208,321 sh (to be offered commonholders on 1-for-20 basis)	.....	.....	.....

Notes—(a) To sell enough common stock to yield $6 million; (b) Morgan Stanley & Co group, underwriters; (c) Harris, Hall & Co group, underwriters; (e) Estimated; (f) Royal Securities Corp sold the bonds to institutions.

Cross-country "jogging" proves this transformer can *take it!*

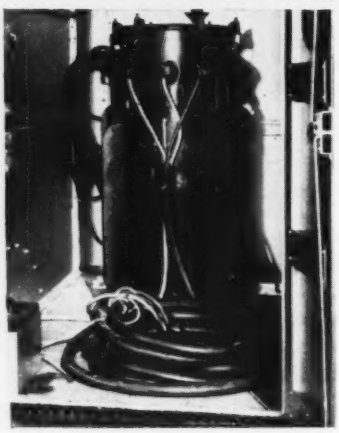
Brockton-Edison's trailer-mounted "CSP®" Transformer gets more jolts and bumps in one day of cross-country service than the average transformer receives in a lifetime. Yet this "CSP" Transformer has performed perfectly every time it has been used to maintain service during emergency or routine transformer change-outs.

Brockton-Edison used "Westinghouse" for their ingenious trailer rig, because they needed an extra-tough transformer for such rugged service. They chose a "CSP" Transformer because its built-in breaker eliminates the necessity for any separately mounted protective devices. All they have to do is make the connection and use the "CSP" Breaker to pick up or disconnect the load.

"CSP" Transformers can take it, whether mounted on a pole or in a trailer, even under the most adverse conditions. Why not prove to yourself that Westinghouse "CSP" Transformers can cut distribution, installation and maintenance costs. Ask your Westinghouse representative for a copy of B-4247-B, *Transformer Costs . . . and their relation to Profits.* Or write to Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-70662-A

Even after miles of hauling over bumpy, rural roads, this rugged "CSP" Transformer gives dependable service. Only normal external transformer connections need be made. The "CSP" Breaker is used to pick up the load.



This 37.5-kva "CSP" Transformer fits compactly into Brockton-Edison's movable trailer because its built-in protection eliminates the need for separate protective devices and excess wiring. This ingenious arrangement simplifies change-outs, with fast service any time . . . anywhere.

YOU CAN BE SURE...IF IT'S Westinghouse

Aluminum Unit Established . . .

. . . to oversee distribution of metal to nonintegrated fabricators. GSA's Witt named chairman of interagency committee

The government has set up a special interagency committee to oversee distribution of primary aluminum to the nation's 17,000 independent, nonintegrated aluminum fabricators.

Major concern of the committee will be the so-called "producer-to-fabricator" provision of the supply contracts signed by the General Services Administration and Aluminum Co of America, Kaiser Aluminum & Chemical Corp, Reynolds Metals Co, and Harvey Machine Co.

Contracts' Provisions . . . The supply contracts have been one of the government incentives for post-Korea expansion of domestic primary aluminum capacity. Here's what the contracts provide:

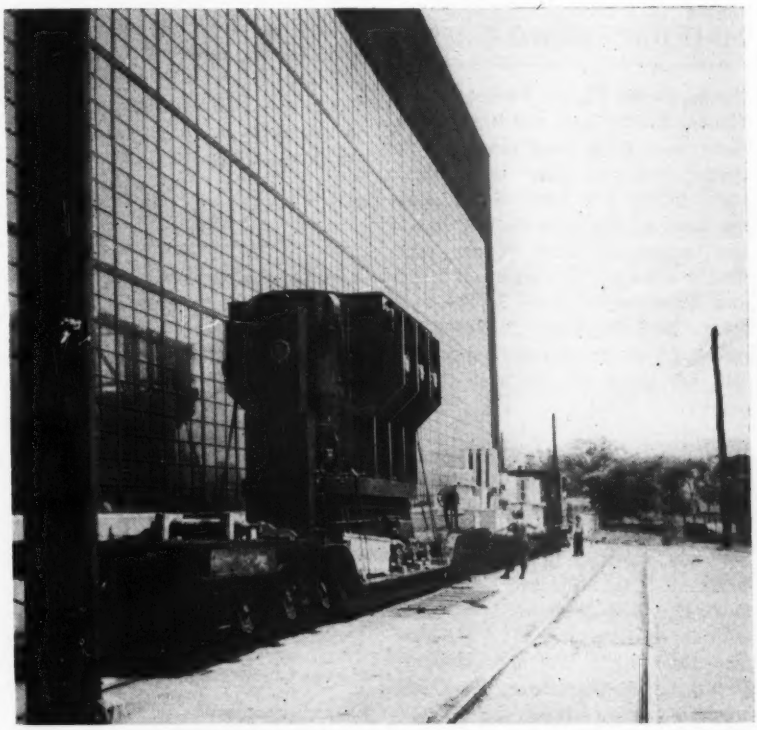
The government has an option to buy total output of the new facilities for the next five years at market price. In turn, the government guarantees to buy any aluminum that the producer cannot sell or use.

The government must notify the producer in advance how much tonnage it will buy. The producer is then required to offer two-thirds of its total output—less any amount the government elects to buy—to the nonintegrated aluminum fabricators. After the first five years, the producer must offer 25% of total output to the nonintegrated fabricators for the next 15 years.

45,000 Tons Reserved . . . During the third quarter, more than 45,000 tons of primary aluminum have been set aside for the nonintegrated fabricators under the terms of these contracts. This tonnage, of course, is in addition to aluminum available to the fabricators from other sources. The tonnage exceeds by 9,000 tons the minimum required by the contracts, and represents cutbacks in the government's third quarter aluminum stockpile plans.

Under GSA's contracts, the producers must offer the tonnage earmarked for the independent fabricators on a "first-come-first-served" basis—unless sold previously through regular contractual arrangements. The aluminum producers have told General Services Administration that the third-quarter set aside for the nonintegrated fabricators has already been contracted for.

These are the members of GSA's special interagency committee to oversee distribution of primary aluminum to nonintegrated fabricators: Frederick W. Witt, GSA's Emergency Procurement Service, chairman; Arthur A. Snow, National Production Authority's Aluminum Division; George F. Dudik, Office of Defense Mobilization; and E. Minton Holland of General Services Administration's Office of General Counsel.



THIS GE 175,000-KVA TRANSFORMER and all its accessories are loaded on two rail cars at the company's transformer plant in Pittsfield, Mass. Arkansas Power & Light Co will use the unit and another identical one at its Harvey Couch and Cecil Lynch stations

Arkansas P&L to Get GE Units

General Electric Co has shipped to Arkansas Power & Light Co two 175,000-kva transformers, reported to be the highest capacity units built to date by GE.

The units, which will transform generator voltage of 17,500 v to 115,-500 v, are scheduled for installation at the utility's Harvey Couch Station, Stamps, Ark., and its Cecil Lynch Station near Little Rock, Ark.

GE engineers said the transformers are 70,000 lb lighter than similar units of less than half the capacity shipped about three years ago to the same power company. Each of the new units, weighing 287,000 lb, will contain 5,880 gal of oil weighing

44,000 lb. Dimensions of the new units, approximately 20 x 22 x 15 ft, are also less than the earlier units, approximately 24 x 25 x 16 ft. Floor space is about 17% less.

Because of their compactness, the transformers will be shipped upright in their own complete tanks. Only installation work required is skidding the units off the rail cars onto their foundations and assembling the bushings and unit coolers.

The GE transformers are of the forced-oil, air-cooled type, utilizing seven oil-to-air heat exchangers. Almost 22 tons of copper were used to make the windings of each transformer.

MANUFACTURING BRIEFS

Phelps Dodge Copper Products Corp, General Cable Corp, and Rome Cable Corp have made these price cuts for copper wire and cable: Bare copper wire, 35.98¢ a lb from 38.08¢; magnet wire, 42.58¢ from 44.68¢; square and rectangular bare copper wire, 39.23¢ from 41.33¢—all down 2.10¢; and weatherproof wire, 37.03¢ a lb from 38.60¢—down 1.57¢. The prices, which are for less-than-carload lots, are based on 30¢ a lb refined copper.

Westinghouse Electric Corp's sales of electric housewares and electric bed coverings during June have topped any previous June on record. R. Z. Sorenson, manager of electric housewares for the Electric Appliance Division, has revealed that housewares sales during June were 131.6% higher than June, 1952, and approximately 85.5% higher than June, 1948, the previous record June for electric housewares.

Centralia, Wash., City Commission has awarded a $115,550 contract to the S. Morgan Smith Co for a 75,000-hp turbine to be installed in the city's expanded hydroelectric plant on the Nisqually River. Delivery of the turbine is scheduled for fall of 1954.

Avco Manufacturing Corp has formed a new subsidiary, Avco of Canada, Ltd, for major expansion and integration of its Canadian interests. The new subsidiary has entered into an agreement to purchase outstanding stock of Moffats, Ltd, Toronto, appliance manufacturers and a producer and distributor of electric and gas ranges. In addition, Avco of Canada also will acquire the assets of Avco's subsidiaries, Bendix Home Appliances Canada, Ltd, and Crosley Radio & Television, Ltd. . . . **H. K. Porter Co, Inc,** Pittsburgh, has acquired a controlling interest in A. Leschen & Sons Rope Co, St. Louis. Operations of the firm will continue as Leschen Wire Rope Co, a division of H. K. Porter, under the direction of D. W. Vernon, vice president and general manager.

Primary aluminum production in the United States again set a new monthly record when May's production reached 210,953,111 lb, the Aluminum Association has reported. May's output exceeded the previous record set in March of this year by about 2 million lb and was 31% over the 161,607,096 lb produced in May, 1952. Output for April, 1953, was 204,142,768 lb.

SALES ASSIGNMENTS

COMPANY STAFFS

General Electric Co's Apparatus Sales Division has appointed A. J. Moore as manager of sales for its New England district with headquarters in Boston. Moore's former post of manager of the company's Providence, R. I., office is now filled by J. P. Patton, formerly a sales engineer in that office.

Orangeburg Manufacturing Co, Inc, has appointed Harding L. Taylor as Southwest district manager to replace Harry N. Dietz, who will assume another executive post with the company.

REPRESENTATIVES

Memco Engineering & Manufacturing Co, Commack, L. I., N. Y., has named Electrical Distributors Co, Philadelphia, as sales representative for its products in the Philadelphia, Baltimore, Washington, D. C., and Richmond, Va., territories.

MEETINGS CALENDAR

International Association of Electrical Leagues
18th Annual Conference, Fairmount Hotel, San Francisco, Aug. 5-8.

American Institute of Electrical Engineers
Pacific General Meeting, Hotel Vancouver, Vancouver, B. C., Sept. 1-4; Middle-Eastern District Meeting, Daniel Boone Hotel, Charleston, W. Va., Sept. 29-Oct. 1; Fall General Meeting, Muehlebach Hotel, Kansas City, Mo., Nov. 2-6.

Illuminating Engineering Society
National Technical Conference. Hotel Commodore, New York, Sept. 13-17.

Northwest Public Power Association
Accounting Section, Monticello Hotel, Longview, Wash., Sept. 17-18.

Public Utilities Association of Virginias
Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 17-20.

Maryland Utilities Association
Fall Conference, Cavalier Hotel, Virginia Beach, Va., Sept. 18-19.

Rocky Mountain Electrical League
50th Annual Fall Convention, Broadmoor Hotel, Colorado Springs, Colo., Sept. 20-23.

National Association of Railroad and Utilities Commissioners
Hotel Roosevelt, New York, Sept. 20-26.

Edison Electric Institute
Accident Prevention Committee, Radisson Hotel, Minneapolis, Sept. 21-22; Transmission-Distribution Committee, Hotel Nicollet, Minneapolis, Oct. 8-9; Electrical Equipment Committee, Jung Hotel, New Orleans, La., Nov. 2-3.

Instrument Society of America
8th National Instrument Exhibit, Sherman Hotel, Chicago, Sept. 21-25.

International Association of Electrical Inspectors
Silver Jubilee Meeting, Edgewater Beach Hotel, Chicago, Sept. 21-26.

National Electrical Industries Show
Sponsored by Eastern Electrical Wholesalers' Association, 69th Regiment Armory, New York, Sept. 29-Oct. 2.

Southeastern Electric Exchange
Fall Meeting, Engineering-Operation Section, Carolina Hotel, Pinehurst, N. C., Oct. 1-2; Accounting Conference, Battery Park Hotel, Asheville, N. C., Oct. 15-16; General Sales Conference, Atlanta Biltmore Hotel, Atlanta, Ga., Nov. 19-21.

American Society of Mechanical Engineers
Fall Meeting, Sheraton Hotel, Rochester, N. Y., Oct. 5-7; Annual Meeting, Statler Hotel, New York, Nov. 29-Dec. 4.

Interstate Power Club
Hotel Martinique, New York, Oct. 5; Hotel Martinique, New York, Dec. 7.

Electric League of Western Pennsylvania
4th Industrial Electric Exposition, William Penn Hotel, Pittsburgh, Oct. 6-8.

Indiana Electric Association
Annual Convention, French Lick Springs Hotel, French Lick, Ind., Oct. 7-9.

Association of Edison Illuminating Companies
Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., Oct. 8-10.

National Association of Electrical Distributors
Fall Meeting, Pacific Zone, Hotel del Coronado, Coronado, Calif., Oct. 11-14.

Iowa Utilities Association
Management Conference, Hotel Fort Des Moines, Des Moines, Oct. 12-13.

Electrical Association of Philadelphia
Biennial Electrical Progress Show sponsored by Manufacturers' Division, Convention Hall, Philadelphia, Oct. 13-15.

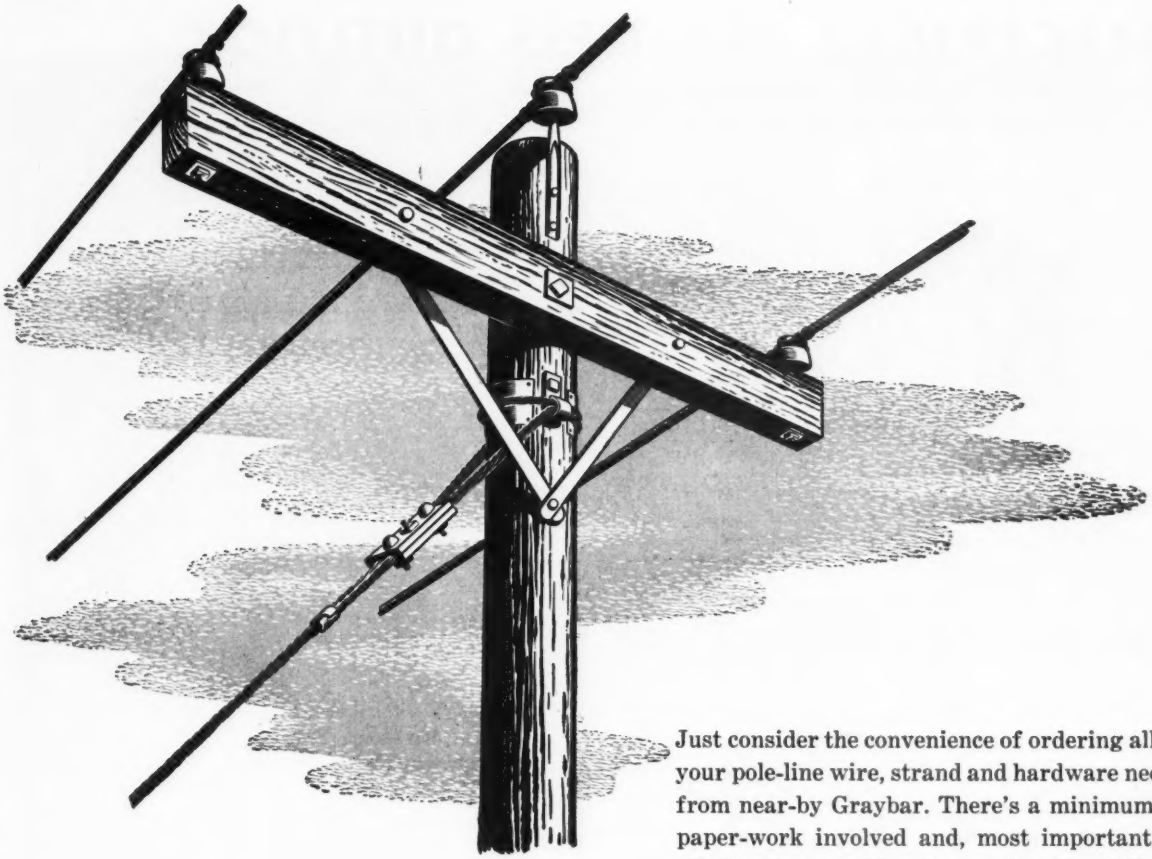
American Standards Association
4th National Standardization Conference and 35th Annual Meeting, Waldorf-Astoria, New York, Oct. 19-21.

Public Information Program
Steering Committee, Edgewater Beach Hotel, Chicago, Oct. 21; Workshop Conference, Edgewater Beach Hotel, Chicago, Oct. 22-23.

National Electrical Manufacturers Association
Annual Meeting, Haddon Hall, Atlantic City, N. J., Nov. 9-12.

Wisconsin Utilities Association
Electric-Gas Section Convention, Schroeder Hotel, Milwaukee, Nov. 11-13.

Pacific Coast Electrical Association
Annual Hawaiian Conference, Honolulu, T. H., Nov. 19-20.



Just consider the convenience of ordering all of your pole-line wire, strand and hardware needs from near-by Graybar. There's a minimum of paper-work involved and, most important of all, there's no problem in co-ordinating deliveries from numerous widely-separated suppliers.

Graybar thoroughly understands the needs of the nation's power companies . . . can furnish supplies and materials "from the bottom of the hole to the top of the pole." Graybar Outside Construction Specialists are always ready to help you plan or carry out any project.

Taken all together, you can see why it pays to call Graybar first for everything electrical . . . routine or emergency. *Graybar Electric Company, Inc. Executive Offices: Graybar Building, 420 Lexington Avenue, New York 17, N. Y.*

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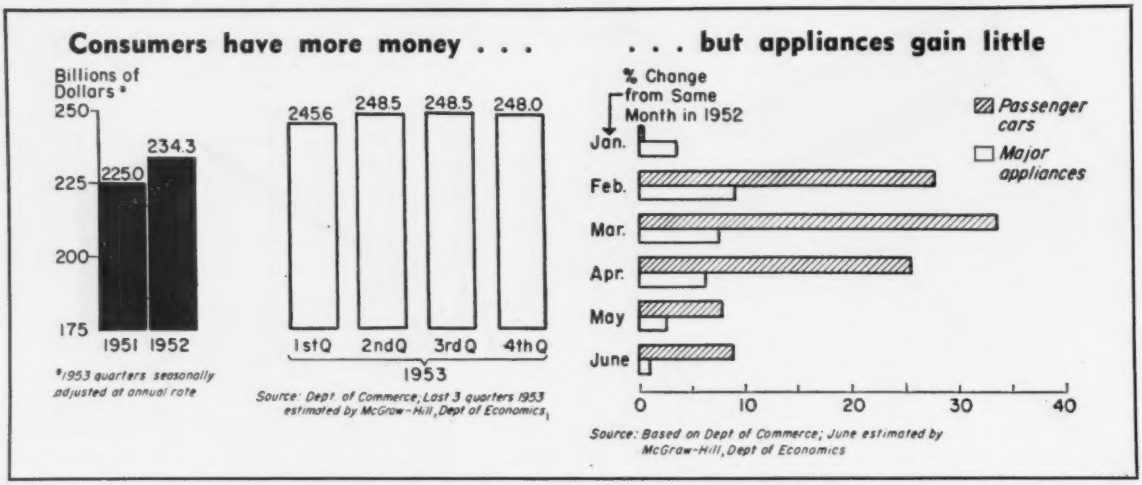


Appliances Have Their Problems

Appliance sales have been better than they were last year —as the chart above shows. But they have not gained nearly as much as appliance dealers and manufacturers would have liked. And the chances are that dealers will continue to be disappointed through the rest of 1953.

Exaggerated expectations are one reason for the general disappointment. Appliance manufacturers have been expanding their plants rapidly, and they expected sales to begin to justify the expansions this year. Dealers thought this would be an extra good year, too. Instead, it's turned out just ahead of 1952, which was far from satisfactory.

Appliance Troubles . . . The best explanation of appliance troubles may be in automobile sales. Auto sales are running far ahead of their 1952 level (chart). Auto makers turned out more than 3.2 million passenger cars in the first half of the year, will make 2.5 million or more in the second half. And they are expected to sell a total of around 5.7 to 5.8 million to consumers during the year.

Automobile sales hit appliance dealers two ways. They are a big drain on consumers' cash—and an even bigger drain on the supply of credit. About 70% of all the cars sold this year involved some borrowed money.

In a normal year, this drain on the supply of credit might not affect appliance dealers. But this is no normal year. With the federal government applying a deliberate policy of tightening up on borrowing (EBO, May 11), a heavy volume of automobile financing may cut into the supply of money available to finance time purchases of appliances.

Additional problems have appeared with some of the older appliances, especially refrigerators. High saturation has made the market harder to sell than dealers and manufacturers had apparently expected. And some of the new appliances—like freezers—have also not lived up to expectations. Sales of summer load-building room coolers, on the other hand, have been excellent. In fact, room coolers have kept more than one shaky dealer in business this year.

The second half of 1953 promises to be more of the same —sales not bad, but not too good either. Consumer incomes will stay at high levels (chart). But competition from automobiles will still be a problem.

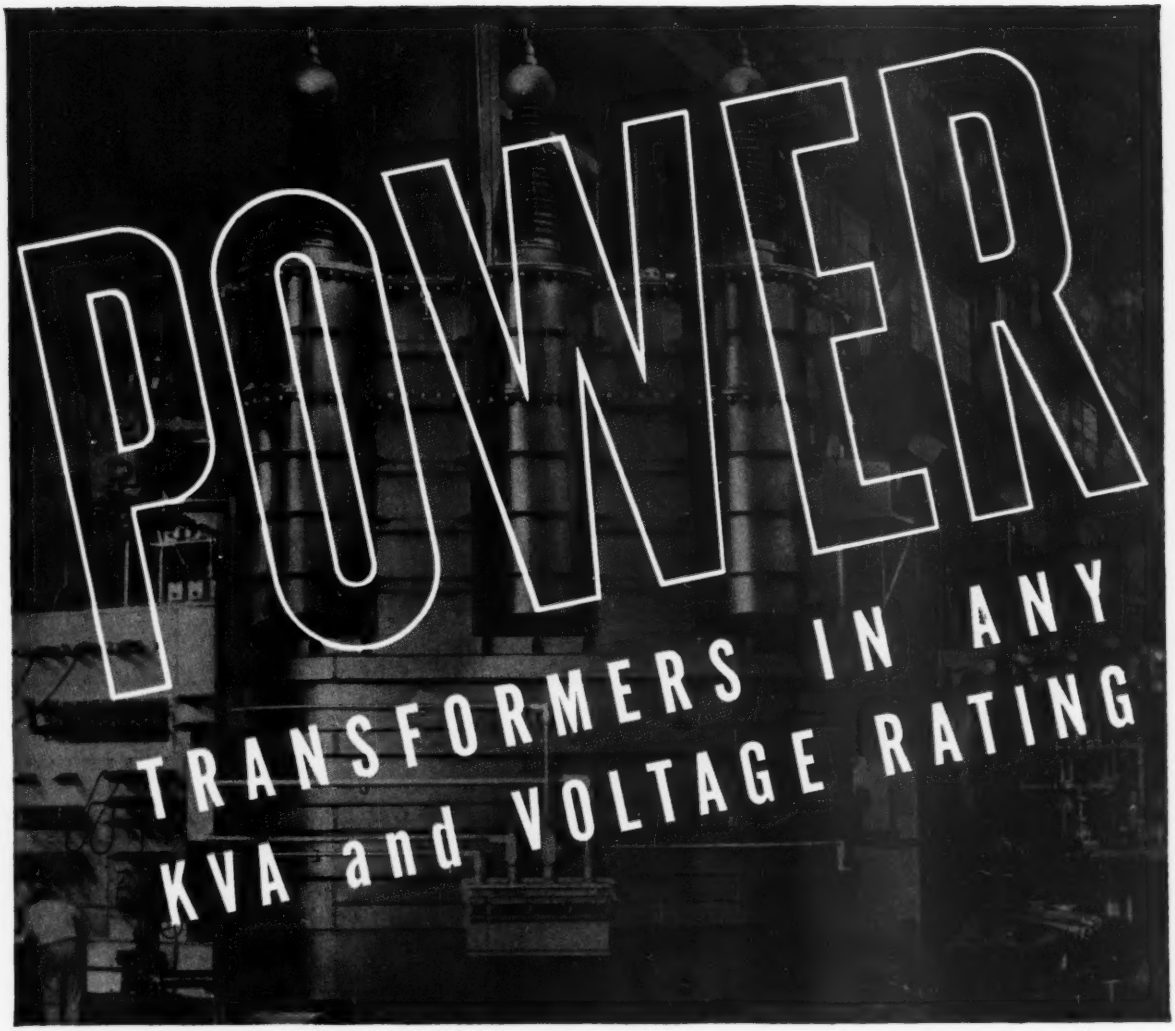
As far as credit goes, for instance, the squeeze will continue. The government still plans to keep money tight. Recent actions designed to ease the money supply are only intended to cover the normal seasonal upswing in money needs in the fall.

Incomes to Level Off . . . An additional problem shows up in the probable course of consumer incomes (chart). Incomes are expected to level off, and perhaps decline slightly toward the end of this year. They will still be high enough to assure a large volume of sales for all consumer goods. But the process of leveling off could have an undesirable effect on appliance sales.

Incomes have been rising steadily since 1950, interrupted only now and then by unusual circumstances—like the 1952 steel strike. This constant increase has helped keep up sales of durable goods, including appliances.

People have used a small increase in income—a couple of dollars a week—to buy an appliance on time payments. Fewer increases in pay will cut out some of these buyers.

Thus, on balance, appliance sales seem likely to be a little lower in the second half than in the first, after allowing for seasonal variations. Generally high incomes will help dealers keep sales reasonably high. But tight credit, plus competition from automobiles, plus the leveling off in income, will chew away a few customers on the margin.



MOLONEY has the capacity to manufacture power transformers of any Kva and voltage rating. When utilities and industrials use Moloney equipment, they obtain the benefits of all the experience and knowhow of over 57 years of engineering, designing and fabricating transformers. This experience produces a better transformer, which, when installed, will give better performance, have greater reliability and require less maintenance. For further information contact your nearest Moloney representative.

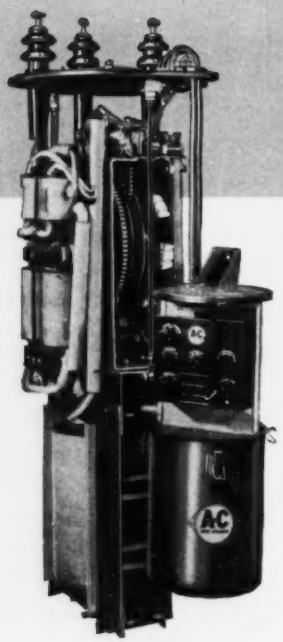
ME 83-9

MOLONEY ELECTRIC COMPANY

Manufacturers of Power Transformers • Distribution Transformers • Load Ratio Control Transformers Step Voltage Regulators • Unit Substations

MOLONEY ELECTRIC = BETTER PERFORMANCE, GREATER RELIABILITY, LESS MAINTENANCE

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS, MO. AND TORONTO, ONT., CANADA



KEY TO Low Operating Costs

Here's the thing that will keep your voltage regulator costs down for years and years of satisfactory operation: unit construction — a feature available only in Allis-Chalmers 5/8% step voltage regulators. Unit construction means thorough, high quality workmanship, practically trouble-free regulation. All connections can be made and inspected *before* the unit is tanked.

And it's unit construction that cuts inspection and service costs on your system. Untanking is fast and easy because transformer, mechanism, and control are all cover-suspended. Just remove the cover bolts and handhole cover; then the unit can be quickly untanked. And since there are no electrical connections to break, you can operate the regulator outside the tank merely by connecting a separate electrical source to the control.

And You Get It Only in

ALLIS-CHALMERS
5/8% STEP
VOLTAGE REGULATORS

A major advantage like unit construction is the natural result of Allis-Chalmers 20 years of 5/8% step regulator manufacturing experience. You get design and construction background like this only in an Allis-Chalmers voltage regulator.

In addition, you get field-proof of performance when you buy an Allis-Chalmers distribution regulator. They have proved their ability to deliver accurate, reliable service in nine years of field operation.

It will pay to get all the facts on Allis-Chalmers distribution regulators. Call the nearest A-C district office or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4105

RATINGS AVAILABLE	7620 Volts—15, 50, 100 amp 5000 Volts—50, 100 amp 2500 Volts—100, 200 amp

ALLIS-CHALMERS

Originators of 5/8% Step Regulation